

**BTEC**

# **HIGHER NATIONALS**

## **Horticulture**

### **Specification**

First Teaching from September 2018

First Certification from September 2019



**Higher National  
Certificate Lvl 4**

**Higher National  
Diploma Lvl 5**

## About Pearson

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## Summary of changes in Pearson BTEC Higher Nationals in Horticulture Issue 4

Summary of changes made between previous issue and this current issue	Page number
<i>Unit 17: Professional Garden Design</i> Assessment Criteria M4 amended by replacing 'British' with 'national' to accommodate assessment for international learners	197
<i>Unit 16: Research Project (Pearson-set)</i> Wording for distinction criteria D3 has been corrected from 'resource' to 'research'	189

Earlier issue(s) show(s) previous changes.

If you need further information on these changes or what they mean, contact us via our website at: [qualifications.pearson.com/en/support/contact-us.html](https://qualifications.pearson.com/en/support/contact-us.html).

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# 1 Introduction

BTEC is one of the world's most recognised applied learning brands, engaging students in practical, interpersonal and thinking skills, for more than thirty years.

BTECs are work-related qualifications for students taking their first steps into employment, or for those already in employment and seeking career development opportunities. BTECs provide progression into the workplace either directly or via study at university and are also designed to meet employer's needs. Therefore, Pearson BTEC Higher National qualifications are widely recognised by industry and higher education as the principal vocational qualification at Levels 4 and 5.

When developing the Pearson BTEC Higher National qualifications in Horticulture, we collaborated with a wide range of students, employers, higher education providers, colleges and subject experts to ensure that the new qualifications meet their needs and expectations. We also worked closely with the relevant Professional Bodies, to ensure alignment with recognised professional standards.

There is now a greater emphasis on employer engagement and work readiness. The new BTEC Higher National qualifications in Horticulture are designed to reflect this increasing need for high quality professional and technical education at Levels 4 and 5, thereby providing students with a clear line of sight to employment and to progression to a degree at Level 6.

## 1.1 The Student Voice

Students are at the heart of what we do. That is why, from the outset, we consulted with students in the development of these qualifications. We involved them in writing groups, sought their feedback, and added their voices and views to those of other stakeholders.

The result, we believe, are qualifications that will meet the needs and expectations of students worldwide.

## 1.2 Why choose Pearson BTEC Higher Nationals?

Pearson BTEC Higher Nationals are designed to help students secure the knowledge skills and behaviours needed to succeed in the workplace. They represent the latest in professional standards and provide opportunities for students to develop behaviours for work, for example by undertaking a group project, or responding to a client brief. A student may even achieve exemption from professional or vendor qualifications, or student membership of selected professional bodies, to help them on their journey to professional competence.

At the same time the BTEC Higher Nationals are intended to keep doors open for future study should a student wish to progress further in their education after their level 5 study. They do this by allowing space for the development of higher education study skills, such as the ability to research. Clear alignment of level of demand with the Framework for Higher Education qualification descriptors at level 4 and 5 means that students wishing to progress to level 6 study should feel better prepared. The Pearson BTEC Higher Nationals address these various requirements by providing:

- A range of core, optional and specialist units, each with a clear purpose, so there is something to suit each student's choice of programme and future progression plans.
- Fully revised content that is closely aligned with the needs of employers, professional bodies, vendors and higher education for a skilled future workforce.
- The opportunity to develop transferable skills useful for work and for higher education, including research skills, the ability to meet deadlines and communication skills.
- Learning Outcomes mapped against Professional Body standards and vendor accreditation requirements, where appropriate.
- Assessments and projects chosen to help students progress to the next stage (this means some are set by the centre to meet local needs, while others are set by Pearson). Students are required to apply their knowledge to a variety of assignments and activities, with a focus on the holistic development of practical, interpersonal and higher level thinking skills.
- An approach to demand at level 4 and 5 which is aligned with the Framework for Higher Education Qualifications (FHEQ).
- Support for student and tutors including Schemes of Work and Example Assessment Briefs (EABs).

### **1.3 HN Global**

Pearson BTEC Higher Nationals are supported by a specially designed range of digital resources, to ensure that tutors and students have the best possible experience during their course. These are available from the HN Global website (<http://www.highernationals.com/>).

With HN Global, tutors can access programme specifications which contain useful information on programme planning and quality assurance processes. Tutors can also view schemes of work and example assessment briefs, helping them create meaningful courses and assessments. HN Global also allows tutors to create and annotate reading lists for their students and also keep up-to-date on the latest news regarding HN programmes.

## **1.4 Qualification Titles**

**Pearson BTEC Level 4 Higher National Certificate in Horticulture**

**Pearson BTEC Level 5 Higher National Diploma in Horticulture**

## **1.5 Qualification codes**

Ofqual Regulated Qualifications Framework (RQF) Qualification numbers:

Pearson BTEC Level 4 Higher National Certificate in Horticulture: 603/2853/8

Pearson BTEC Level 5 Higher National Diploma in Horticulture: 603/2852/6

## **1.6 Awarding institution**

Pearson Education Ltd.

## **1.7 Key features**

Pearson BTEC Higher National qualifications in Horticulture offer:

- A stimulating and challenging programme of study that will be both engaging and memorable for students
- The essential subject knowledge that students need to progress successfully into further study or the world of work
- A simplified structure: students undertake a substantial core of learning in the Higher National Certificate and can build on this in the Higher National Diploma, with optional units linked to their specialist area of study
- Recommended optional unit groupings at Level 5 Diploma, so there is something to suit each student's preference of study and future progression plans
- Refreshed content that is closely aligned with Professional Body, employer and higher education needs
- Assessments that consider cognitive skills (what students know) along with affective and applied skills (respectively how they behave and what they can do)
- Unit-specific grading and Pearson-set assignments
- A varied approach to assessment that supports progression to Level 6 and also allows Centres to offer assessment relevant to the local economy, thereby accommodating and enhancing different learning styles

- Quality Assurance measures – as outlined in sections 6 and 7 of this Programme Specification – to ensure that all stakeholders (e.g. professional bodies, universities, colleges and students) can feel confident in the integrity and value of the qualifications
- A qualification designed to meet the needs and expectations of students aspiring to work in an international horticultural environment.

## **Qualification frameworks**

Pearson BTEC Higher National qualifications are designated higher education qualifications in the UK. They are aligned to the Framework for Higher Education Qualifications (FHEQ) in England, Wales and Northern Ireland, and Quality Assurance Agency (QAA) Subject Benchmark Statements. These qualifications are part of the UK Regulated Qualifications Framework (RQF).

## **1.8 Collaborative development**

Students completing their BTEC Higher Nationals in Horticulture will be aiming to go on to employment or progress to a final year at university. Therefore, it was essential that we developed these qualifications in close collaboration with experts from professional bodies and universities, and with the providers who will be delivering the qualifications.

We are very grateful to the university and further education tutors, employers, Professional Body representatives and other individuals who have generously shared their time and expertise to help us develop these new qualifications.

- Belfast Metropolitan College
- Hartpury College (Associate Faculty of the University of the West of England)
- North Lindsey College
- North Shropshire College
- NPTC Group of Colleges
- Landex
- National Land-based College
- Andersplus (Horticulture Recruitment)
- Shropshire County Council (Country Parks and Heritage Department)
- National Farmers Union (NFU)
- Institute of Agricultural Secretaries and Administrators (IAgSA)
- Wrexham County Council (Gardens and Parks Division)

## 2 Programming purpose and objectives

### 2.1 Purpose of the BTEC Higher Nationals in Horticulture

The purpose of BTEC Higher Nationals in Horticulture is to develop students as professional, self-reflecting individuals able to meet the demands of employers in the Horticulture sector and adapt to a constantly changing world. The qualifications aim to widen access to higher education and enhance the career prospects of those who undertake them.

### 2.2 Objectives of the BTEC Higher Nationals in Horticulture

The objectives of the BTEC Higher Nationals in Horticulture are as follows:

- To equip students with Horticultural skills, knowledge and the understanding necessary to achieve high performance in the global horticultural environment.
- To provide education and training for a range of careers in Horticulture, including Garden Design, Public Grounds Management, Sports Turf Management and Arboriculture.
- To provide insight and understanding into the diversity of roles within Horticulture, recognising the importance of collaboration at all levels.
- To equip students with knowledge and understanding of culturally diverse organisations, cross-cultural issues, diversity and values.
- To provide opportunities for students to enter or progress in employment in Horticulture, or progress to higher education qualifications such as an Honours degree in Horticulture, Horticultural Production, Protective Crop Management, Sports Turf Management, Horticultural Management or a related area.
- To provide opportunities for students to develop the skills, techniques and personal attributes essential for successful working lives.
- To support students to understand the local, regional and global context of Horticulture and, for those students with a global outlook, to aspire to an international career.
- To provide students with opportunities to address contemporary issues facing the industry, and society at large; with particular emphasis on sustainability and the environment, recognising the role that Horticulture plays in addressing these issues.
- To provide opportunities for students to achieve a nationally-recognised professional qualification within their chosen area of specialisation.
- To provide opportunities for students to achieve certifications.

- To offer students the chance of career progression in their chosen field, with particular emphasis on achieving management-level positions, professional recognition and beyond.
- To allow flexibility of study and to meet local or specialist needs.
- To offer a balance between employability skills and the knowledge essential for students with entrepreneurial, employment or academic aspirations.
- To provide students with opportunities to engage in an industry-recognised apprenticeship scheme that aligns with their employer's needs and their own career aspirations.
- To provide students with the context in which to consider professional ethics and their relation to personal, professional and statutory responsibilities within the industry.

We meet these objectives by:

- Providing a thorough grounding in Horticultural principles that leads the student to a range of specialist progression areas relating to individual professions within the sector.
- Equipping individuals with commercial acumen, understanding and horticultural skills for success in a range of the roles in this sector.
- Enabling progression to a university degree by supporting the development of appropriate academic study skills.
- Enabling progression to further professional qualifications in specific horticultural areas by mapping to units in a range of professional qualifications.

### **Who is this qualification for?**

The BTEC Higher National qualifications in Horticulture are aimed at students wanting to continue their education through applied learning. Higher Nationals provide a wide-ranging study of Horticulture and are designed for students who wish to pursue or advance their career in an aspect of Horticulture. In addition to the knowledge, understanding and skills that underpin the study of Horticulture, Pearson BTEC Higher Nationals in Horticulture give students experience of the breadth and depth of the sector that will prepare them for further study or training.

## 2.3 Aims of the Level 4 Higher National Certificate in Horticulture

The Level 4 Higher National Certificate in Horticulture offers students a broad introduction to the subject area via a mandatory core of learning, while allowing for the acquisition of skills and experience through the selection of optional units. This effectively builds underpinning core skills while preparing the student for progression onto Level 5. Students will gain a wide range of sector knowledge tied to practical skills gained in research, self-study, directed study and workplace scenarios.

At Level 4 students develop a broad knowledge and awareness of key aspects of Horticulture through five core units, which include one unit assessed by a Pearson-set assignment. The units are:

- Principles of Botany
- Business and the Business Environment
- Plant Identification and Classification
- Plant and Soil Science
- Managing a Successful Project (Pearson-set).

Three further optional units will need to be identified at Level 4 from the following:

Optional units:

- Principles of Crop Production
- Plant and Crop Nutrition
- Protective Crop Production
- Land-based Machinery and Technology
- Rural Business Administration and Accounting
- Human Resource Management
- Marketing Essentials
- Teaching in a Specialist Subject

Graduates successfully completing the Higher National Certificate will be able to demonstrate a sound knowledge of the basic concepts of Horticulture. They will be able to communicate accurately and appropriately and they will have the qualities needed for employment that requires some degree of personal responsibility. They will have developed a range of transferable skills to ensure effective team working, independent initiatives, organisational competence and problem-solving strategies. They will be adaptable and flexible in their approach to Horticulture, show resilience under pressure, and meet challenging targets within a given resource.

## 2.4 Aims of the Level 5 Higher National Diploma in Horticulture

The Level 5 Higher National Diploma in Horticulture is designed to support progression into relevant occupational areas through a number of recommended optional unit groupings or on to degree-level study. These groupings are linked to Professional Body standards (where appropriate) and can provide professional status and progression to direct employment.

Holders of the Level 5 Higher National Diploma will have developed a sound understanding of the principles in their field of study and will have learned to apply those principles more widely. They will have learned to evaluate the appropriateness of different approaches to solving problems. They will be able to perform effectively in their chosen field and will have the qualities necessary for employment in situations requiring the exercise of personal responsibility and decision-making.

## 2.5 What could these qualifications lead to?

The Level 4 Higher National Certificate provides a solid grounding in Horticulture, which students can build on should they decide to continue their studies beyond the Certificate stage. The Level 5 Higher National Diploma allows students to specialise by committing to specific career paths and progression routes to degree-level study.

On successful completion of the Level 5 Higher National Diploma, students can develop their careers in the horticultural sector through:

- Entering employment
- Continuing existing employment
- Linking with the appropriate Professional Body
- Committing to Continuing Professional Development (CPD)
- Progressing to university.

### 2.5.1 Progression to university

The Level 5 Higher National Diploma is recognised by Higher Education providers as meeting admission requirements to many relevant horticultural-related courses, for example:

- BSc (Hons) in Horticulture
- BSc (Hons) in Horticultural Management
- BSc (Hons) in Horticultural Business Management
- BSc (Hons) in Horticulture (Plant/Crop Production)
- BSc (Hons) in Horticulture (Plant Science)



Students should always check the entry requirements for degree programmes at specific Higher Education providers. After completing a BTEC Higher National Certificate or Diploma, students can also progress directly into employment.

### University recognition and articulations

We work with a range of higher education institutions around the world that recognise and accept BTEC Higher Nationals as a qualification for entry onto an undergraduate degree. Many universities allow advanced entry onto the second or third year of a degree, and agreements can include credit transfer, articulation and case-by-case admission. Students should be aware that university admission criteria are always subject to change and remain at the discretion of the institution. Students should take time to understand the course entry requirements for subject, year and grade before applying.

For more information on entry requirements, including 2+1 articulations, please visit: <https://www.highernationals.com/degree-finder>.

### 2.5.2 Employment

The skills offered as part of the Pearson BTEC Higher National Diploma can provide graduates with the opportunity to work in many different areas of the horticultural sector. Below are some examples of job roles each qualification could lead to.

Pathway	Job Roles
Horticulture	Plant Breeder Crop Production Manager Garden Centre Assistant Manager/Manager Self Employed Contract Gardener Gardener Landscape and Garden Designer Landscape Contractor Tree Surgeon Forester Country Parks and Heritage Manager Horticulture Instructure Plant Research Officer Horticultural Product Sales Representative Horticulture Lecturer

## 2.6 Use of Maths and English within the curriculum

Those working within the Horticulture sector cannot just rely on their technical skills and must ensure they develop all relevant employability skills to increase employment opportunities. For example, they will be required to communicate appropriately with stakeholders throughout their career, so the ability to use maths and English in a professional context is an essential employability skill that must be developed at all levels of study.

Development of essential maths and English skills are embedded throughout these qualifications in accordance with industry requirements and below are some examples of how these skills are developed in the BTEC Higher National curriculum:

- Written reports
- Formal presentations
- Informal conversations
- Use of professional, sector specific language

Some aspects of Horticulture require high level maths skills and we strongly recommend all students complete diagnostic maths assessments preferably before beginning a Higher National course, as well as having an A\* to C grade and/or 9 to 4 in GCSE Maths, prior to starting the course (see Entry requirements in *section 3.2* of this specification).

## 2.7 How Pearson BTEC Higher Nationals in Horticulture provide both transferable employability skills and academic study skills

Students need both relevant qualifications and employability skills to enhance their career prospects and contribute to their personal development. Pearson Higher National Horticulture qualifications embed throughout the programme the development of key skills, attributes and strengths required by 21st century employers.

Where employability skills are referred to in this specification, this generally refers to skills in five main categories:

- **Cognitive and problem-solving skills:** critical thinking, approaching non-routine problems by applying expert and creative solutions, use of systems and digital technology, generating and communicating ideas creatively.
- **Intra-personal skills:** self-management, adaptability and resilience, self-monitoring and self-development, self-analysis and reflection, planning and prioritising.

- **Interpersonal skills:** effective communication and articulation of information, working collaboratively, negotiating and influencing, self-presentation.
- **Commercial skills:** sector awareness; sales; marketing/promotion; budget management/monitoring;
- **Business skills:** awareness of types of companies, company formation, invoicing, calculating fees, business management.

Pearson Example Assessment Briefs (EABs) make recommendations for a range of real or simulated assessment activities, for example, group work where appropriate, to encourage development of collaborative and interpersonal skills or a solution focused case study to provide the opportunity to develop cognitive skills. There are specific requirements for the assessment of these skills, as relevant, within the assessment grids for each unit. EABs are for guidance and support only and must be customised and amended according to localised needs and requirements. All assignments must still be verified as per the internal verification process.

Students can also benefit from opportunities for deeper learning, where they are able to make connections between units and select areas of interest for detailed study. In this way BTEC Higher Nationals provide a vocational context in which students can develop the knowledge and academic study skills required for progression to university degree courses, including.

- Active research skills
- Effective writing skills
- Analytical skills
- Critical thinking
- Creative problem-solving
- Decision-making
- Team building
- Exam preparation skills
- Digital literacy
- Competence in assessment methods used in higher education.

To support you in developing these skills in your students, we have developed a map of Higher Education relevant transferable and academic study skills, available in appendices.

## 3 Planning your programme

### 3.1 Delivering the Higher Nationals in Horticulture

You play a central role in helping your students to choose the right BTEC Higher National qualification.

You should assess your students very carefully to ensure that they take the right qualification and the right pathways or optional units, to allow them to progress to the next stage. You should check the qualification structures and unit combinations carefully when advising students.

You will need to ensure that your students have access to a full range of information, advice and guidance in order to support them in making the necessary qualification and unit choices. When students are recruited, you need to give them accurate information on the title and focus of the qualification for which they are studying.

### 3.2 Entry requirements and admissions

Although Pearson do not specify formal entry requirements, as a centre it is your responsibility to ensure that the students you recruit have a reasonable expectation of success on the programme.

For students who have recently been in education, the entry profile is likely to include one of the following:

- A BTEC Level 3 qualification in Horticulture
- A GCE Advanced Level profile that demonstrates strong performance in a relevant subject or adequate performance in more than one GCE subject. This profile is likely to be supported by GCSE grades A\* to C, and/or 9 to 4 (or equivalent) in subjects such as maths and English
- Other related Level 3 qualifications
- An Access to Higher Education Diploma awarded by an approved further education institution
- Related work experience
- An international equivalent of the above.

Centres may wish to consider applicants' prior learning when considering their acceptance on a BTEC Higher Nationals, through Recognition of Prior Learning. (For further information please refer to *section 8* of this document.)

### 3.2.1 English language requirements for Higher Nationals

Pearson's mission is to help people make more of their lives through learning. In order for students to be successful on Pearson BTEC Higher National qualifications which are **both** taught and assessed in English, it is critical that they have an appropriate level of English language skills.

The following clarifies the requirements for all centres when recruiting applicants on to new Pearson BTEC Higher National qualifications.

All centres delivering the new Pearson BTEC Higher National qualifications must ensure that all students who are non-native English speakers and who have not undertaken their final two years of schooling in English, can demonstrate capability in English at a standard equivalent to the levels identified below, before being recruited to the programme **where the programme is both taught and assessed in English:**

- Common European Framework of Reference (CEFR) level B2
- PTE **51**
- IELTS **5.5**; Reading and Writing must be at **5.5**
- or equivalent.

It is up to the centre to decide what proof will be necessary to evidence individual student proficiency.

The following clarifies the requirements for all centres when recruiting applicants on to new Pearson BTEC Higher National qualifications which are taught in a language other than English, but are assessed in English.

All centres delivering the new Pearson BTEC Higher National qualifications **wholly or partially** in a language other than English, but who are assessed in English, must ensure that all students can demonstrate capability in English at a standard equivalent to the levels identified below, on completion of the programme:

- Common European Framework of Reference (CEFR) level B2
- PTE **51**
- IELTS **5.5**; Reading and Writing must be at **5.5**
- or equivalent.

It is up to the centre to decide what proof will be necessary to evidence individual student proficiency.

### 3.2.2 Centre approval

To ensure that centres are ready to assess students and that we can provide the support that is needed all centres must be approved before they can offer these qualifications. For more information about becoming a centre and seeking approval to run our qualifications please visit the support section on our website (<http://qualifications.pearson.com/>).

### **3.2.3 Level of sector knowledge required**

We do not set any requirements for tutors, but we do recommend that centres assess the overall skills and knowledge of the teaching team, which should be relevant, up to date and at the appropriate level.

### **3.2.4 Resources required**

As part of your centre approval, you will need to show that the necessary material resources and work spaces are available to deliver BTEC Higher Nationals. For some units, specific resources are required, this is clearly indicated in the unit descriptors.

### **3.2.5 HN Global support**

HN Global is an online resource that supports centre planning and delivery of BTEC Higher Nationals by providing appropriate teaching and learning resources. For further information see Sections 5 and 6 of this Programme Specification.

### **3.2.6 Modes of delivery**

Subject to approval by Pearson, centres are free to deliver BTEC Higher Nationals using modes of delivery that meet the needs of their students. We recommend making use of a wide variety of modes, including:

- Full-time
- Part-time
- Blended learning.

### **3.2.7 Recommendations for employer engagement**

BTEC Higher Nationals are vocational qualifications and as an approved centre you are encouraged to work with employers on the design, delivery and assessment of the course. This will ensure that students enjoy a programme of study that is engaging and relevant, and which equips them for progression. There are suggestions in section 5.2 about how employers could become involved in delivery and/or assessment, but these are not intended to be exhaustive and there will be other possibilities at a local level.

### **3.2.8 Support from Pearson**

We provide a range of support materials, including Schemes of Work and Example Assessment Briefs, with supporting templates. You will be allocated an External Examiner early in the planning stage, to support you with planning your assessments, and there will be training events and support from our Subject Leads.

### 3.2.9 Student employability

All BTEC Higher Nationals have been designed and developed with consideration of National Occupational Standards, where relevant, and have been mapped to subject benchmarks. (see *Appendix 6*).

Employability skills such as team working and entrepreneurialism as well as practical hands-on skills have been built into the design of the learning aims and content. This gives you the opportunity to use relevant contexts, scenarios and materials to enable students to develop a portfolio of evidence demonstrating the breadth of their skills and knowledge in a way that equips them for employment.

### 3.3 Access to study

This section focuses on the administrative requirements for delivering a BTEC Higher National qualification. It will be of value to Quality Nominees, Programme Leaders and Examinations Officers.

Our policy regarding access to our qualifications is that:

- They should be available to everyone who is capable of reaching the required standards
- They should be free from any barriers that restrict access and progression.

There should be equal opportunities for all those wishing to access the qualifications. We refer Centres to our Pearson Equality and Diversity Policy, which can be found in the support section of our website (<http://qualifications.pearson.com/>).

Centres are required to recruit students to Higher National programmes with integrity. They will need to make sure that applicants have relevant information and advice about the qualification, to make sure it meets their needs. Centres should review the applicant's prior qualifications and/or experience to consider whether this profile shows that they have the potential to achieve the qualification. For students with disabilities and specific needs, this review will need to take account of the support available to the student during the teaching and assessment of the qualification. For further guidance and advice please refer to Section 9 on reasonable adjustments.

### 3.4 Student registration and entry

All students should be registered for the qualification, and appropriate arrangements made for internal and external verification. For information on making registrations for the qualification, you will need to refer to the information manual available in the support section of our website (<http://qualifications.pearson.com/>).

Students can be formally assessed only for a qualification on which they are registered. If students' intended qualifications change (for example, if a student decides to choose a different specialist pathway), then the centre must transfer the student to the chosen pathway appropriately. Please note that student work cannot be sampled if the student is not registered or is registered on an incorrect pathway.



### 3.5 Access to assessments

Assessments need to be administered carefully, to ensure that all students are treated fairly, and that results and certification are issued on time, allowing students to move on to chosen progression opportunities.

Our equality policy requires that all students should have equal opportunity to access our qualifications and assessments, and that our qualifications are awarded in a way that is fair to every student. We are committed to making sure that:

- Students with a protected characteristic (as defined in legislation) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to students who do not share that characteristic.
- All students achieve the recognition they deserve for undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

Further information on access arrangements can be found on the Joint Council for Qualifications website (<http://www.jcq.org.uk/>).

### 3.6 Administrative arrangements for internal assessment

#### 3.6.1 Records

You are required to retain records of assessment for each student. Records should include assessments taken, decisions reached and any adjustments or appeals. Further information on quality and assessment can be found in our UK and international guides available in the support section on our website (<http://qualifications.pearson.com/>). We may ask to audit your records, so they must be retained as specified. All student work must be retained for **a minimum of 12 weeks** after certification has taken place.

#### 3.6.2 Reasonable adjustments to assessment

A reasonable adjustment is one that is made before a student takes an assessment, to ensure that he or she has fair access to demonstrate the requirements of the assessments.

You are able to make adjustments to internal assessments to take account of the needs of individual students. In most cases this can be achieved through a defined time extension or by adjusting the format of evidence. We can advise you if you are uncertain as to whether an adjustment is fair and reasonable. You need to plan for time to make adjustments, if necessary.

Further details on how to make adjustments for students with protected characteristics are available on the support section of our website (<http://qualifications.pearson.com/>).

### 3.6.3 Special consideration

Special consideration is given after an assessment has taken place for students who have been affected by adverse circumstances, such as illness, and require an adjustment of grade to reflect normal level of attainment. You must operate special consideration in line with Pearson policy (see previous paragraph). You can provide special consideration related to the period of time given for evidence to be provided, or for the format of the assessment (if it is equally valid). You may not substitute alternative forms of evidence to that required in a unit, or omit the application of any assessment criteria to judge attainment. Pearson can consider applications for special consideration in line with the policy, which can be found in the document linked above.

Please note that your centre must have a policy for dealing with mitigating circumstances if students are affected by adverse circumstances, such as illness, which result in non-submission or late submission of assessment.

### 3.6.4 Appeals against assessment

Your centre must have a policy for dealing with appeals from students. These appeals may relate to assessment decisions being incorrect or assessment not being conducted fairly. The first step in such a policy could be a consideration of the evidence by a Programme Leader or other member of the programme team. The assessment plan should allow time for potential appeals after assessment decisions have been given to students. If there is an appeal by a student, you must document the appeal and its resolution. Students have a final right of appeal to Pearson, but only if the procedures that you have put in place have been followed.

Further details of our policy on enquiries and appeals is available on the support section of our website (<http://qualifications.pearson.com/>).

If your centre is located in England or Wales and the student is still dissatisfied with the final outcome of their appeal they can make a further appeal to the Office of the Independent Adjudicator (OIA) by emailing: [enquiries@oiahe.org.uk](mailto:enquiries@oiahe.org.uk). In Northern Ireland a further appeal may be lodged with the Northern Ireland Public Service Ombudsman (NIPSO) by emailing: [nipso@nipso.org.uk](mailto:nipso@nipso.org.uk).

## 3.7 Dealing with malpractice in assessment

'Malpractice' means acts that undermine the integrity and validity of assessment, the certification of qualifications and/or may damage the authority of those responsible for delivering the assessment and certification.

Pearson does not tolerate actual or attempted actions of malpractice by learners, centre staff or centres in connection with Pearson qualifications. Pearson may impose penalties and/or sanctions on learners, centre staff or centres where malpractice or attempted malpractice has been proven.

Malpractice may occur or be suspected in relation to any unit or type of assessment within a qualification. For further details on malpractice and advice on preventing malpractice by learners, please see Pearson's Centre Guidance: Dealing with Malpractice, available on our website.

The procedures we ask you to adopt vary between units that are internally assessed and those that are externally assessed.

Centres are required to take steps to prevent malpractice and to investigate instances of suspected malpractice. Learners must be given information that explains what malpractice is for internal assessment and how suspected incidents will be dealt with by the centre. The Centre Guidance: Dealing with Malpractice document gives full information on the actions we expect you to take.

Pearson may conduct investigations if we believe a centre is failing to conduct internal assessment according to our policies. The above document gives further information and examples, and details the penalties and sanctions that may be imposed.

In the interests of learners and centre staff, centres need to respond effectively and openly to all requests relating to an investigation into an incident of suspected malpractice.

### **3.7.1 Internally assessed units**

Centres are required to take steps to prevent malpractice and to investigate instances of suspected malpractice. Students must be given information that explains what malpractice is for internal assessment and how suspected incidents will be dealt with by the Centre. Full information on dealing with malpractice and the actions we expect you to take is available on the support section of our website (<http://qualifications.pearson.com/>).

Pearson may conduct investigations if it is believed that a Centre is failing to conduct internal assessment according to Pearson policies. The above document gives further information, provides examples, and details the penalties and sanctions that may be imposed.

### **3.7.2 Student malpractice**

The head of centre is required to report incidents of suspected learner malpractice that occur during Pearson qualifications. We ask centres to complete *JCQ Form M1* ([www.jcq.org.uk/malpractice](http://www.jcq.org.uk/malpractice)) and email it with any accompanying documents (signed statements from the learner, invigilator, copies of evidence, etc) to the Investigations Processing team at [candidatemalpractice@pearson.com](mailto:candidatemalpractice@pearson.com). The responsibility for determining appropriate sanctions or penalties to be imposed on learners lies with Pearson.

Learners must be informed at the earliest opportunity of the specific allegation and the centre's malpractice policy, including the right of appeal. Learners found guilty of malpractice may be disqualified from the qualification for which they have been entered with Pearson.

Failure to report malpractice constitutes staff or centre malpractice.

### 3.7.3 Staff and centre malpractice

The head of centre is required to inform Pearson's Investigations team of any incident of suspected malpractice (which includes maladministration) by centre staff, before any investigation is undertaken. The head of centre is requested to inform the Investigations team by submitting a *JCQ M2 Form* (downloadable from [www.jcq.org.uk/malpractice](http://www.jcq.org.uk/malpractice)) with supporting documentation to [pqsmalpractice@pearson.com](mailto:pqsmalpractice@pearson.com). Where Pearson receives allegations of malpractice from other sources (for example Pearson staff, anonymous informants), the Investigations team will conduct the investigation directly or may ask the head of centre to assist.

Pearson reserves the right in cases of suspected malpractice to withhold the issuing of results/certificates while an investigation is in progress. Depending on the outcome of the investigation, results and/or certificates may not be released or they may be withheld.

We reserve the right to withhold certification when undertaking investigations, audits and quality assurance processes. You will be notified within a reasonable period of time if this occurs.

### 3.7.4 Sanctions and appeals

Where malpractice is proven, we may impose sanctions or penalties, such as:

- mark reduction for affected external assessments
- disqualification from the qualification
- debarment from registration for Pearson qualifications for a period of time.

If we are concerned about your centre's quality procedures we may impose sanctions such as:

- working with centres to create an improvement action plan
- requiring staff members to receive further training
- placing temporary suspensions on certification of learners
- placing temporary suspensions on registration of learners
- debarring staff members or the centre from delivering Pearson qualifications
- suspending or withdrawing centre approval status.

The centre will be notified if any of these apply.

Pearson has established procedures for centres that are considering appeals against penalties and sanctions arising from malpractice. Appeals against a decision made by Pearson will normally be accepted only from the head of centre (on behalf of learners and/or members or staff) and from individual members (in respect of a decision taken against them personally). Further information on appeals can be found in the *JCQ Appeals booklet* (<https://www.jcq.org.uk/exams-office/appeals>).

## 4 Programme structure

### 4.1 Units, Credits, Total Qualification Time (TQT) and Guided Learning (GL)

The Higher National Certificate (HNC) is a Level 4 qualification made up of 120 credits. It is usually studied full-time over one year, or part-time over two years.

The Higher National Diploma (HND) is a Level 4 and Level 5 qualification made up of 240 credits. It is usually studied full-time over two years, or part-time over four years.

Pearson would expect that an HND student would have achieved at least 90 credits at Level 4 before progressing to Level 5 units. This allows for the students to submit the remaining 30 credits at Level 4 while undertaking their Level 5 study.

Students undertaking an HND who fail to successfully complete the full qualification may be awarded an HNC, if their credit achievement permits.

BTEC Higher Nationals consist of core units, specialist units and optional units:

- Core units are mandatory
- Specialist units are designed to provide a specific occupational focus to the qualification and are aligned to Professional Body standards
- Required combinations of optional units are clearly set out in the tables below.

All units are usually 15 credits in value, or a multiple thereof. These units have been designed from a learning time perspective, and are expressed in terms of **Total Qualification Time (TQT)**. TQT is an estimate of the total amount of time that could reasonably be expected to be required for a student to achieve and demonstrate the achievement of the level of attainment necessary for the award of a qualification. TQT includes undertaking each of the activities of Guided Learning, Directed Learning and Invigilated Assessment. Each 15-credit unit approximates to a Total Unit Time of 150 hours and 60 hours of Guided Learning.

**Total Qualification Time (TQT)** Higher National Certificate (HNC) = 1,200 hours

**Total Qualification Time (TQT)** Higher National Diploma (HND) = 2,400 hours

Examples of activities which can contribute to Total Qualification Time include:

- Guided Learning
- Independent and unsupervised research/learning
- Unsupervised compilation of a portfolio of work experience
- Unsupervised e-learning
- Unsupervised e-assessment
- Unsupervised coursework
- Watching a pre-recorded podcast or webinar
- Unsupervised work-based learning.

**Guided Learning (GL)** is defined as the time when a tutor is present to give specific guidance towards the learning aim being studied on a programme. This definition includes lectures, tutorials and supervised study in, for example, open learning centres and learning workshops. Guided Learning includes any supervised assessment activity; this includes invigilated examination and observed assessment and observed work-based practice.

**Total Guided Learning (GL)** Higher National Certificate (HNC) = 480 hours

**Total Guided Learning (GL)** Higher National Diploma (HND) = 960 hours

Some examples of activities which can contribute to Guided Learning include:

- Classroom-based learning supervised by a tutor
- Work-based learning supervised by a tutor
- Live webinar or telephone tutorial with a tutor in real time
- E-learning supervised by a tutor in real time
- All forms of assessment which take place under the immediate guidance or supervision of a tutor or other appropriate provider of education or training, including where the assessment is competence-based and may be turned into a learning opportunity.

## 4.2 Programme structures

The programme structures specify:

- The total credit value of the qualification
- The minimum credit to be achieved at the level of the qualification
- The core units
- The specialist units
- The optional units
- The maximum credit value in units that can be centre commissioned.

When combining units for a Pearson Higher National qualification, it is the centre's responsibility to make sure that the correct combinations are followed.

### 4.2.1 Pearson BTEC Level 4 Higher National Certificate in Horticulture

- Qualification credit value: a minimum of 120 credits. This is made up of eight units, each with a value of 15 credits.
- **Total Qualification Time (TQT)** Higher National Certificate (HNC) = 1,200 hours
- **Total Guided Learning (GL)** Higher National Certificate (HNC) = 480 hours
- There is a required mix of Core, Specialist and Optional units totalling 120 credits. All units are at Level 4.
- In some cases a maximum of 30 credits from a Higher National qualification may be from units designed by the centre and approved by Pearson. Core units may **not** be substituted and are **mandatory**. For more information please refer to Higher National Commissioned Qualifications.



<b>Pearson BTEC Level 4 Higher National Certificate in Horticulture</b>		<b>Unit credit</b>	<b>Level</b>
Core Unit	<b>1 Principles of Botany</b>	15	4
Core Unit	<b>2 Business and the Business Environment</b>	15	4
Core Unit	<b>3 Plant Identification and Classification</b>	15	4
Core Unit	<b>4 Plant and Soil Science</b>	15	4
Core Unit	<b>5 Managing a Successful Project (Pearson-set)</b>	15	4
Optional Unit	<b>Plus one Optional Level 4 unit (see below)</b>	15	4
Optional unit	<b>Plus one Optional Level 4 unit (see below)</b>	15	4
Optional unit	<b>Plus one Optional Level 4 unit (see below)</b>	15	4

<b>Optional unit bank</b>		<b>Unit credit</b>	<b>Level</b>
<b>Optional Level 4 units:</b>			
Optional unit	<b>6 Principles of Crop Production</b>	15	4
Optional unit	<b>7 Plant and Crop Nutrition</b>	15	4
Optional unit	<b>8 Protective Crop Production</b>	15	4
Optional unit	<b>9 Land-based Machinery and Technology</b>	15	4
Optional unit	<b>10 Rural Business Administration and Accounting</b>	15	4
Optional unit	<b>11 Human Resource Management</b>	15	4
Optional unit	<b>12 Marketing Essentials</b>	15	4
Optional unit	<b>13 Management Accounting</b>	15	4
Optional unit	<b>14 Teaching in a Specialist Subject</b>	15	4

#### 4.2.2 Pearson BTEC Level 5 Higher National Diploma in Horticulture

The Level 5 Higher National Diploma consists of the appropriate Level 4 Higher National Certificate (above) plus an additional 120 credits at Level 5 delivered via the following optional unit groupings:

- Horticulture (General)
- Horticulture (Garden Design)
- Horticultural (Public Grounds Management)
- Horticulture (Sports Turf Management)
- Horticulture (Arboriculture)

Qualification credit value: a minimum of 240 credits, of which 120 credits are at Level 5, and 120 credits are at Level 4 and usually attained via the HNC.

There is a required mix of core and optional units totalling 240 credits. The Core units required for each Level 5 (in addition to the optional units) are Plant Selection and Propagation, which is weighted at 15 credits, and Research Project (Pearson-set), weighted at 30 credits.

The requirements of the Higher National Certificate (or equivalent) have to be met. In some cases a maximum of 60 credits can be imported from another RQF Pearson BTEC Higher National qualification and/or from units designed by the Centre and approved by Pearson. Core units and specialist units may **not** be substituted.

<b>Pearson BTEC Level 5 Higher National Diploma in Horticulture</b>		<b>Unit credit</b>	<b>Level</b>
<b>Level 4 Units:</b>			
Core unit	<b>1 Principles of Botany</b>	15	4
Core unit	<b>2 Business and the Business Environment</b>	15	4
Core unit	<b>3 Plant Identification and Classification</b>	15	4
Core unit	<b>4 Plant and Soil Science</b>	15	4
Core unit	<b>5 Managing a Successful Project (Pearson-set)</b>	15	4
Optional unit	<b>Plus one Optional Level 4 unit</b>	15	4
Optional unit	<b>Plus one Optional Level 4 unit</b>	15	4
Optional unit	<b>Plus one Optional Level 4 unit</b>	15	4
<b>Level 5 Units:</b>			
Core Unit	<b>15 Plant Selection and Propagation</b>	15	5
Core Unit	<b>16 Research Project (Pearson-set)</b>	30	5
Optional unit	<b>Plus one Optional Level 5 unit (see below)</b>	15	5
Optional unit	<b>Plus one Optional Level 5 unit (see below)</b>	15	5
Optional unit	<b>Plus one Optional Level 5 unit (see below)</b>	15	5
Optional unit	<b>Plus one Optional Level 5 unit (see below)</b>	15	5
Optional unit	<b>Plus one Optional Level 5 unit (see below)</b>	15	5

Optional Level 5 Unit Groupings		Unit credit	Level
<b>Group A: Garden Design</b>			
Optional unit	17 Professional Garden Design	15	5
Optional unit	18 Professional Garden Design Practice	15	5
Optional unit	19 Planning and Implementation of Hard Landscapes	15	5
<b>Group B: Public Grounds Management</b>			
Optional unit	20 Landscape and Garden Maintenance	15	5
Optional unit	21 Habitat Restoration and Repair	15	5
Optional unit	22 Plant and Crop Health (Diseases, Pests and Weeds)	15	5
<b>Group C: Sports Turf Management</b>			
Optional unit	23 Amenity and Sports Turf Construction and Establishment	15	5
Optional unit	24 Natural and Artificial Turf Care and Maintenance	15	5
Optional Unit	22 Crop and Plant Health (Diseases, Pests and Weeds)	15	5
<b>Group D: Arboriculture</b>			
Optional unit	25 Tree Care and Arboricultural Management	15	5
Optional unit	26 Woodland Management	15	5
Optional unit	27 Environmental Management and Conservation	15	5

Optional unit bank		Unit credit	Level
<b>Optional Level 5 units:</b>			
Optional unit	17 Professional Garden Design	15	5
Optional unit	18 Professional Garden Design Practice	15	5
Optional unit	19 Planning and Implementation of Hard Landscapes	15	5
Optional unit	20 Landscape and Garden Maintenance	15	5
Optional unit	21 Habitat Restoration and Repair	15	5
Optional unit	22 Plant and Crop Health (Diseases, Pests and Weeds)	15	5
Optional unit	23 Amenity and Sports Turf Construction and Establishment	15	5
Optional unit	24 Natural and Artificial Turf Care and Maintenance	15	5
Optional unit	25 Tree Care and Arboricultural Management	15	5
Optional unit	26 Woodland Management	15	5
Optional unit	27 Environmental Management and Conservation	15	5
Optional unit	28 Plant Physiology and Environmental Adaptation	15	5
Optional unit	29 Plant Breeding and Genetics	15	5
Optional unit	30 Business Strategy	15	5
Optional unit	31 Global Business Environment	15	5
Optional unit	32 Product and Service Development	15	5
Optional unit	33 Identifying Entrepreneurial Opportunities	15	5
Optional unit	34 Advanced Financial Accounting	15	5
Optional unit	35 Sustainable Practices	15	5
Optional unit	36 Work Experience	15	5

### 4.2.3 Meeting local needs (MLN)

Centres should note that Pearson BTEC Higher National qualifications have been developed in consultation with centres, employers and relevant professional organisations. The units were designed to meet the skill needs of the sector and thereby allow coverage of the full range of employment within the sector. Centres should make maximum use of the choices available to them within the specialist pathways to meet the needs of their students, as well as the local skills and training needs.

Where centres identify a specific need that cannot be addressed using the units in this specification, centres can seek approval to use units from other RQF Pearson BTEC Higher National qualifications, through the MLN process (refer to *Commissioned qualification design and validation service* of our website

<http://qualifications.pearson.com> or get in touch your Pearson regional contact for application details. Centres will need to justify the rationale for importing units from other RQF Pearson BTEC Higher National specifications. **Meeting local need applications must be made in advance of delivery and before 31 January in the year of student registration.**

The flexibility to import standard units from other RQF Pearson BTEC Higher National specifications is **limited to a maximum of 30 credits in a BTEC HNC qualification and a maximum of 60 credits in a BTEC HND qualification (30 credits at Level 4 and 30 credits at Level 5)**. This is an overall maximum of units that can be imported. MLN units cannot be used at the expense of the mandatory units in any qualification nor can the qualification's rules of combination, as detailed in the specification, be compromised. It is the responsibility of the centre requesting the MLN to ensure that approved units are used only in eligible combinations.

For the **Pearson BTEC Level 4 Higher National Certificate and Pearson BTEC Level 4 Higher National Diploma in Horticulture** the maximum number of credits that can be imported by pathway are as follows:

Qualification	Pathway	Import at Level 4	Import at Level 5
HNC Horticulture	<b>Horticulture (General)</b>	30	-

Qualification	Optional Unit Groupings	Import at Level 4	Import at Level 5
HND Horticulture	<b>Horticulture (General)</b>	30	30
	<b>Horticultural (Garden Design)</b>	-	30
	<b>Horticultural (Public Grounds Management)</b>	-	30
	<b>Horticulture (Sports Turf Management)</b>	-	30
	<b>Horticulture (Arboriculture)</b>	-	30

#### 4.2.4 Pearson BTEC Higher National Commissioned Development

Where MLN does not provide enough flexibility in terms of qualification structure, centres can request design and development of units by Pearson to meet their specific needs. This is offered by the following types of developments; full commission or partial commission.

We would be pleased to discuss your ideas for a Pearson BTEC Higher National Commissioned Development. For more information please refer to the *Commissioned qualification design and validation service* on our website  
<http://qualifications.pearson.com>

Once the centre is ready to proceed with a commissioned development, an application must be made, which provides a clear rationale for the development request. Pearson will review the application and may confirm or deny the request. The commissioned unit(s) will be authored by Pearson, in full consultation within the commissioning centre. Applications must be made one year in advance of the first year of commissioned unit(s) delivery

### 4.3 Pearson-set Assignments

There are Pearson-set assignments, as part of the core units. Each year, Pearson will issue a *Theme* and (for Level 4) a set of related *Topics*. Centres will develop an assignment, to be internally assessed, to engage students in work related to the Pearson-set Theme.

At Level 4, tutor will select a Topic to further define their approach to the Theme and assignment. At Level 5, it is expected that students will define their own Topic, in negotiation with Tutors, based on the Pearson-set Theme.

For example, from the Higher Nationals in Business:

Theme: “Corporate Social Responsibility (CSR) and its importance for sustainability and competitive advantage”

Level 4 Topics:

- How to start up a socially responsible company
- The impact of CSR on a functional area (e.g. HR, Marketing, Finance) within an organisation to promote profitability and financial sustainability.
- Implementing CSR activities within organisations to meet sustainability objectives.

Centres can find relevant support in the Pearson-set Assignment Guidance for the units, and the theme and topic release documentation which will be provided for each level.

The aim of the Pearson-set assignments is to provide a common framework for centres to develop work that will allow cross-sector benchmarking, through the standardisation of student work, and identification and sharing of ‘best practice.’ in higher education teaching and learning. Pearson will share the ‘best practice’ results with all centres. For further information about Pearson-set Assignments and assessment, see *section 6* of this document.

## 4.4 Optional Units

The Optional units available in the Higher Nationals in Horticulture are intended to provide Centres with a range of units that may be applicable to an identified specialism. These units have been written to provide scope for a Centre to tailor their course offer to include areas of additional content that provide a unique student experience.

As an example, at Level 4, a standard approach to Horticulture (General) might see the following units offered:

Unit	Type	Credits
Unit 1 Principles of Botany	Core	15
Unit 2 Business and the Business Environment	Core	15
Unit 3 Plant Identification and Classification	Core	15
Unit 4 Plant and Soil Science	Core	15
Unit 5 Managing a Successful Project (Pearson-set)	Core	15



Unit	Type	Credits
Unit 7 Plant and Crop Nutrition	Optional	15
Unit 8 Protective Crop Production	Optional	15
Unit 9 Land-based Machinery and Technology	Optional	15

However, a Centre may choose to develop a more 'specialised' programme; with greater emphasis on Business Administration and offer:

Unit	Type	Credits
Unit 1 Principles of Botany	Core	15
Unit 2 Business and the Business Environment	Core	15
Unit 3 Plant Identification and Classification	Core	15
Unit 4 Plant and Soil Science	Core	15
Unit 5 Managing a Successful Project (Pearson-set)	Core	15
Unit 10 Rural Business Administration and Accounting	Optional	15
Unit 11 Human Resource Management	Optional	15
Unit 12 Marketing Essentials	Optional	15

In each example, students would have the key skills for Horticulture (through practice-based units at Level 4 and Level 5), but will have a unique experience based on the combination of Optional units offered by the Centre.

## 4.5 Recommended Level 4 and Level 5 Unit Combinations

To ensure that students studying at Level 5 are enabled to engage with the learning and teaching provided within Optional Units, we recommend that careful consideration be given to the units offered at Level 4 and how these prepare the student for Level 5 Optional Units.

The following table provides guidance as to recommended Level 4 unit(s) that should be offered, in order that students are prepared for the corresponding Level 5 unit(s).

Combination of Level 4 Units	Level 5 Unit
Unit 10 Rural Business Administration and Accounting (term 1) Unit 13 Management Accounting (term 2)	Unit 34 Advanced Financial Accounting
Unit 2 Business and the Business Environment	Unit 30 Business Strategy Unit 31 Global Business Environment
Unit 6 Principles of Crop Production	Unit 22 Plant and Crop Health (Diseases, Pests and Weeds)
Unit 1 Principles of Botany	Unit 28 Plant Physiology and Environmental Adaptation
Unit 9 Land-based Machinery and Technology	Unit 25 Tree Care and Arboricultural Management Unit 26 Woodland Management
Unit 12 Marketing Essentials	Unit 32 Product and Service Development

## 4.6 The unit descriptor

The Unit Descriptor is how we define the individual units of study that make up a Higher National qualification. Students will study and complete the units included in the programme offered at your centre.

We have described each part of the unit, as below. You may refer to any of the Unit Descriptors in *Section 10* of this programme specification.

<b>Unit Title</b>	A broad statement of what the unit will cover.
<b>Unit Code</b>	The Ofqual unit designation
<b>Unit Type</b>	There are three unit types: core (mandatory to all pathways); specialist (mandatory to specific pathways); and optional (available to most pathways)
<b>Unit level</b>	All Pearson BTEC Higher National units are at Level 4 or Level 5
<b>Credit value</b>	The credit value is related to total qualification time (TQT) and unit learning hours (ULH), and is easy to calculate. 1 credit is equal to 10 ULH, so 15 credits are equal to 150 ULH. To complete a Higher National Certificate or Diploma students are expected to achieve the appropriate number of credits
<b>Introduction</b>	Some general notes on the unit, setting the scene, stating the purpose, outlining the topics and skills gained on completion of the unit
<b>Learning Outcomes</b>	The Learning Outcomes are explicit statements that clearly express what students will be able to do after the completion of the unit. There are, typically, four Learning Outcomes for each unit.
<b>Essential Content</b>	This section covers the content that students can expect to study as they work towards achieving their Learning Outcomes.

**Learning Outcomes and Assessment Criteria**

Each unit sets out the 'Pass', 'Merit' and 'Distinction' criteria for that unit. When assignments are graded, a tutor will refer to this table, which connects the unit's Learning Outcomes with the student's work. This assignment may be graded at 'Pass', 'Merit' or 'Distinction level, depending on the quality of the students work.

**Recommended Resources**

Lists the resources appropriate to support the study of this unit. This includes books, journals and online material to support learning. The programme tutor may suggest alternatives and additions, usually with a local application or relevance.

## Web resources – referencing:

Some units have web resources as part of their recommended resources lists. Hyperlinking to these resources directly can be problematic as locations and addresses of resources can change over time. To combat this we have referenced web resources as follows:

- [1] A link to the main page of the website
- [2] The title of the site
- [3] The name of the section or element of the website where the resource can be found
- [4] The type of resource it is, which may be one of the following –
  - research
  - general reference
  - tutorials
  - training
  - e-books
  - report
  - wiki
  - article
  - datasets
  - development tool
  - discussion forum

## Web

- |                              |  |
|------------------------------|--|
| [1]www.ingentaconnect.com    | [2]Ingenta Connect                         |
|                              | [3]Systemic Botany                         |
|                              | [4](Journal)                               |
| [1]www.journals.uchicago.edu | [2]University of Chicago Press Journals    |
|                              | [3]International Journal of Plant Sciences |
|                              | [4](Journal)                               |

## 5 Teaching and learning

The aim of this section is to provide guidance to Centres so that they can engage students in a dynamic, interactive and reflective learning experience. This experience should effectively prepare students to successfully engage in the assessments, which will measure depth, as well as breadth, of knowledge. Teaching should stimulate academic engagement, develop challenging yet constructive discourse and encourage students to reflect on their own performance in preparation for a professional career. Additionally, Centres are encouraged to expose students to autonomous and independent learning, which will facilitate the development of their academic skills, experiences and techniques required as they progress from one level of study to the next.

Centres are encouraged to develop programmes that have a distinctive focus on entry into work, delivering a curriculum that embeds employability, has a strong commitment to ethics and diversity, and introduces students to contemporary as well as seminal research. All teaching and learning should reflect the expectations of employers and society, and be informed and guided by external benchmarks such as professional and statutory bodies. In so doing students completing a Higher National in Horticulture will have the attributes, skills, principles and behaviours that will enable them to make a valuable contribution to local, national and international commerce.

The contributions students make to their own experiences, alongside the experience of their peers, is invaluable. Student engagement and the student voice should form a significant aspect of a student's life. Centres are encouraged to gather student opinions on a range of teaching and learning matters, which would be used to inform and enhance future practice within a programme of study and within a Centre.

### 5.1 Delivering quality and depth

A high quality teaching and learning experience should include qualified and experienced lecturers, an interactive and engaging curriculum, motivated and inspired students, and a support system that caters for the pastoral as well as academic interests of students.

In addition to delivering a quality learning experience, Centres must also encourage students to have a deeper understanding of the subject where they are able to go beyond the fundamentals of explaining and describing. Students are expected to show they can analyse data and information, make sense of this and then reach evaluative judgements. At the higher levels of study there is an expectation that students will be able to apply a degree of criticality to their synthesis of knowledge. This criticality would come from exposure to appropriate and relevant theories, concepts and models.

One of the reasons for delivering a quality learning experience, which has depth as well as breadth, is the benchmarking of the qualification to the Framework for Higher Education Qualifications (FHEQ). It also meets requirements set by the Regulated Qualifications Framework (RQF). The first stage of a Higher National in Horticulture is the Higher National Certificate (HNC), which is aligned with Level 4 of both frameworks; with the Higher National Diploma (HND) aligned with Level 5. This means that the HNC has the same level of demand and expectations as the first year of a degree programme, with the HND having the same level of demand and expectations as the second year of a degree programme.

Centres are expected to provide a broadly similar experience for students to that which they would have if they attended a similar programme at a university. This could mean:

- Providing access to library facilities which has, as a minimum, available copies (physically and/or electronically) of all required reading material
- Access to research papers and journals
- Utilising a virtual learning environment (VLE) to support teaching
- Working with local employers (see below) to present real-life case studies
- Creating schemes of work that embrace a range of teaching and learning techniques
- Listening to the student voice.

Irrespective of the type of programme on which a student is enrolled, it is highly advisable that students are inducted onto their Higher National programme. This induction should include an introduction to the course programme and academic study skills that will be essential in supporting their research and studies, and, therefore, enhance the learning experience.

An induction programme should consist of the following:

- Course programme overview
- Preparing for lessons
- Effective engagement in lectures and seminars
- Making the most out of their tutor
- Assignment requirements
- Referencing and plagiarism
- Centre policies
- Academic study skills.

Pearson offer Higher National Global Study Skills to all students – an online toolkit that supports the delivery, assessment and quality assurance of BTECs in centres. This is available on the HN Global (website [www.highernationals.com](http://www.highernationals.com)). HN Global provides a wealth of support to ensure that tutors and students have the best possible experience during their course.

In addition, there is a wide range of free-to-access websites that can be used to support students in developing their learning and academic study skills.

## **5.2 Engaging with employers**

Just as the student voice is important, so too is the employer's. Employers play a significant role in the design and development of all regulated qualifications, including the Higher Nationals in Horticulture. This input should extend into the learning experience, where engagement with employers will add value to students, particularly in transferring theory into practice.

Centres should consider a range of employer engagement activities. These could include:

- Field trips to local Horticultural Centres, Crop Producers or Allied Business Services
- Inviting members of the local membership organisations centre to present guest lectures
- Using employers to judge the quality of assessed presentations and/or products
- (For the more entrepreneurial) establishing a panel of experts who students can pitch an idea to.

While detailed guidance on assessment has been provided in this specification (see *section 6*), it is worth considering the involvement of employers when determining assessment strategies and the use of different assessment vehicles. This enables Centres to design assessments that are more closely related to what students would be doing in the workplace. Employers are able to comment on relevance and content, as well as the challenge presented by an assessment. Notwithstanding this, ultimately it is the Centre's responsibility to judge the extent to which any employer contributes to teaching and learning.

## **5.3 Engaging with students**

Students are integral to teaching and learning. As such it is important that they are involved as much as possible with most aspects of the programme on to which they are enrolled. This input could include taking into account their views on how teaching and learning will take place, their role in helping to design a curriculum, or on the assessment strategy that will test their knowledge and understanding.



There are many ways in which to capture the student voice and student feedback, both formal and informal. Formal mechanisms include the nomination of student representatives to act as the collective student voice for each student cohort, student representation at course team meetings, and an elected Higher Education representative as part of the Student Union. Student forums should also take place periodically throughout the year with minutes and action plans updated and informing the overall annual course monitoring process. Unit specific feedback can also be collated by students completing unit feedback forms, end of year course evaluations, and scheduled performance review meetings with their tutor.

However, this should not be the only time when feedback from students is sought. Discourse with students should be constant, whereby teachers adopt a 'reflection on action' approach to adjust teaching, so that students are presented with an environment that is most supportive of their learning styles. Just as employers could have an input into assessment design, so too could students. This will support the development of assignments that are exciting and dynamic, and fully engage students in meaningful and informative assessment.

The biggest advantage of consulting students on their teaching, learning and assessment is securing their engagement in their own learning. Students are likely to feel empowered and develop a sense of ownership of all matters related to teaching, learning and assessment, not just their own experiences. Students could also view themselves as more accountable to their lecturers, ideally seeing themselves as partners in their own learning and not just part of a process.

## **5.4 Planning and structuring a programme**

Learning should be challenging yet exciting; teaching should be motivating and inspirational. Consequently, both teaching and learning should form part of a programme structure that is active, flexible and progressive, and has an industry focus wherever possible.

It is important for a programme structure to be effectively planned, taking into account the nature of the student cohort, the primary mode of delivery (face-to-face or distance learning) and the level of study. It is also advisable to consider the student voice (whether that voice is heard through end of programme feedback, or through on-going dialogue) when planning how and when students will be exposed to a particular subject. One other vital source of information that centres would do well to embrace is the feedback from tutors who have been and/or will be delivering learning.

It is recommended that centres establish a programme planning forum where various stakeholders are represented. This forum could consider different perspectives of teaching and learning and how these are planned into an effective programme structure. Consideration could be given to, for example, the holistic and consistent use of Virtual Learning Environments (VLEs), a programme of field trips, a strategy for engaging with employers, and how and when to assess learning.

Consideration should be given to a number of factors when planning a programme structure. These include:

- The sequencing of units
- Whether to have condensed or expanded delivery
- Teaching and learning techniques.

### 5.4.1 Sequencing units

The level of demand embedded within a unit is benchmarked to recognised standards. This applies to all units within a level of study, and this means that all Level 4 units have similar demands, as do all Level 5 units. However, this does not mean that units can, or should, be delivered in any order. For example, in the Higher National Diploma in Horticulture it is strongly advised that Level 4 units are delivered, and achieved, by students before progression to Level 5. However, students are able to progress to Level 5 with a minimum of 90 credits at Level 4.

Within each level it is advisable to sequence units so that those providing fundamental knowledge and understanding are scheduled early in the programme. It may also be advisable to schedule the assessment of units requiring the practice and application of more advanced skills later in the programme.

For example, at Level 4 if a more business administration pathway is required, Unit 2 Business and the Business Environment and Unit 10 Rural Business Administration and Accounting could be the first two units that Higher National Certificate students are exposed to. Unit 2 introduces students to the fundamentals of the sector, how it is structured and the internal and external factors that influence strategy and operations. Unit 10 provides students with an opportunity to gain an understanding of how business administrations operate and how they are managed. At Level 5 Centres could sequence, for example, Unit 34 Advanced Financial Accounting before Unit 30 Business Strategy. The former provides a broader understanding of financial management and business performance, with the latter using part of this knowledge to develop a deeper understanding strategic management.

### 5.4.2 Condensed, expanded and mixed delivery

The next consideration is whether to deliver a unit in a condensed format alongside other units, or to deliver units over an extended period. The following tables provide examples of this, based on four units being delivered in one teaching block.

#### Condensed version:

Weeks 1 to 6	Week 7	Weeks 8 to 13	Week 14
Unit 1	Assessment	Unit 3	Assessment
Unit 2		Unit 4	

#### Expanded version:

Weeks 1 to 12	Weeks 13 and 14
Unit 1	Assessment
Unit 2	
Unit 3	
Unit 4	

**Mixed version:**

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
Unit 1													Assessment
Unit 2					Assessment	Unit 3							
					Unit 4								

The decision to deliver a condensed, expanded or mixed programme would depend on a number of factors, including availability of resources, the subjects to be taught and the requirements of students. Each version has advantages: the condensed version would provide an opportunity for students to gain early success and achievement. This will enhance their self-efficacy, the sense of one's belief in one's ability to succeed, and self-confidence, with tutors being able to identify and respond to less able students early in the teaching and learning cycle. The advantages of the expanded version include providing a longer timescale for students to absorb new knowledge and therefore, potentially, improve success, and giving tutors an opportunity to coach and support less able students over a longer period of time. The mixed version, with some units spanning over the entire period and others lasting for shorter periods, provides opportunities for learning in some units to support development in others. This format may be particularly suited to a combination of practical and theoretical units. In all cases, the choice of which type of unit sequence must consider student opportunities as well as staff and physical resources of the Centre.

As there are pros and cons to both approaches, the use of a planning forum would help to ensure the most suitable approach is taken. For example, Centres could choose to deliver the first teaching block using the expanded version, with the subsequent teaching block being delivered through a condensed approach.

It should be noted that the above consideration would apply equally to programmes that are being delivered face-to-face or through distance learning.

### 5.4.3 Drawing on a wide range of delivery techniques

As part of planning the range of techniques that will be used to deliver the syllabus, centres should also consider an appropriate combination of techniques for the subject.

The table below lists some of the techniques that centres could introduce into a planned programme structure.

Technique	Face-to-face	Distance learning
Lectures and seminars	These are the most common techniques used by tutors. They offer an opportunity to engage with a large number of students, where the focus is on sharing knowledge through the use of presentations.	Delivery would be through video conferencing and/or pre-recorded audio and/or visual material, available through an online platform. Synchronous discussion forums could also be used.
Workshops	These are used to build on knowledge shared via tutors and seminars. Teaching can be more in-depth where knowledge is applied, for example to case studies or real-life examples. Workshops could be student-led, where students present, for example, findings from independent study.	While more challenging to organise than for face-to-face delivery, workshops should not be dismissed. Smaller groups of three or four students could access a forum simultaneously and engage in the same type of activity as for face-to-face.
Tutorials	These present an opportunity for focused one-to-one support, where teaching is led by an individual student's requirements. These can be most effective in the run up to assessment, where tutors can provide more focused direction, perhaps based on a formative assessment.	Other than not necessarily being in the same room as a student, tutors could still provide effective tutorials. Video conferencing tools provide the means to see a student, which makes any conversation more personal.
Virtual Learning Environments (VLEs)	These are invaluable to students studying on a face-to-face programme. Used effectively, VLEs not only provide a repository for taught material such as presentation slides or handouts, but could be used to set formative tasks such as quizzes. Further reading could also be located on a VLE, along with a copy of the programme documents, such as the handbook and assessment timetable.	A VLE is a must if students are engaged with online delivery through distance or blended learning, as this would be the primary or the key source of learning. Where distance learning is primarily delivered through hard copies of workbooks, etc., the same principle would apply as for face-to-face learning.

Technique	Face-to-face	Distance learning
Blended learning	The combination of traditional face-to-face learning and online learning. This can enable the students to gain personalised support, instruction and guidance while completing assigned activities and tasks remotely.	Offline learning enables students to develop autonomy and self-discipline by completing set activities and tasks with limited direction and traditional classroom-based constraints.
Work-based learning	Any opportunity to integrate work-based learning into a curriculum should be taken. This adds realism and provides students with an opportunity to link theory to practice in a way in which case studies do not. Many full-time students are involved in some form of employment, either paid or voluntary, which could be used, where appropriate, as part of their learning, for example when assignments require students to contextualise a response to a real organisation.	It is likely that the majority of distance learning students would be employed and possibly classed as mature students. Bringing theory to life through a curriculum, which requires work-based application of knowledge, would make learning for these students more relevant and meaningful. Perhaps more importantly, assessment should be grounded in a student's place of work, wherever possible.
Guest speakers	These could be experts from industry or visiting academics in the subject area that is being studied. They could be used to present a lecture/seminar, a workshop or to contribute to assessment. The objective is to make the most effective use of an expert's knowledge and skill by adding value to the teaching and learning experience.	As long as the expert has access to the same platform as the students then the value-added contribution would still be very high. Consideration would need to be given to timings and logistics, but with some innovative management this technique would still have a place in distance learning programmes.
Field trips	Effectively planned field trips, which have a direct relevance to the syllabus, would add value to the learning experience. Through these trips students could relate theory to practice, have an opportunity to experience organisations in action, and potentially open their minds to career routes.	The use of field trips could be included as part of a distance learning programme. They will add the same value and require the same planning. One additional benefit of field trips for distance learning is that they provide an opportunity for all students in a cohort to meet, which is a rare occurrence for distance learning students.

#### **5.4.4 Assessment considerations**

Centres should design assessment for learning. This is where an assessment strategy requires students to engage with a variety of assessment tools that are accessible, appropriately challenging, and support the development of student self-efficacy and self-confidence. To ensure that assignments are valid and reliable, centres must implement robust quality assurance measures and monitor the effectiveness of their implementation (see section 6 of this Programme Specification). This includes ensuring that all students engage in assessment positively and honestly.

Assessment also provides a learning opportunity for all stakeholders of the assessment to have access to feedback that is both individual to each student and holistic to the cohort. Feedback to students should be supportive and constructive. Student self-efficacy (and therefore self-confidence) can be significantly enhanced where feedback not only focuses on areas for improvement but recognises the strengths a student has. At the cohort level, similar trends could be identified that inform future approaches to assessments and teaching. Assessment is an integral part of the overall learning process and assessment strategy must be developed to support effective, reflective, thinking Sport & Exercise Science practitioners for the future. Assessment can be either formative, summative or both.

#### **5.4.5 Formative assessment**

Formative assessment is primarily developmental in nature and designed to give feedback to students on their performance and progress. Assessment designed formatively should develop and consolidate knowledge, understanding, skills and competencies. It is a key part of the learning process and can enhance learning and contribute to raising standards.

Through formative assessment tutors can identify students' differing learning needs early on in the programme and so make timely corrective interventions. Tutors can also reflect on the results of formative assessment to measure how effective the planned teaching and learning is at delivering the syllabus. Each student should receive one set of written formative feedback, otherwise some students may feel that others are being given more than their share of verbal feedback.

#### **5.4.6 Summative assessment**

Summative assessment is where students are provided with the assignment grades contributing towards the overall unit grade. For summative assessment to be effective it should also give students additional formative feedback to support on-going development and improvement in subsequent assignments. All formative assessment feeds directly into the summative assessment for each unit and lays the foundations from which students develop the necessary knowledge and skills required for the summative assessment.

### 5.4.7 Assessment feedback

Effective assessment feedback is part of continuous guided learning which promotes learning and enables improvement. It also allows students to reflect on their performance and helps them understand how to make effective use of feedback. Constructive and useful feedback should enable students to understand the strengths and limitations of their performance, providing positive comments where possible as well as explicit comments on how improvements can be made. Feedback should reflect the Learning Outcomes and marking criteria to also help students understand how these inform the process of judging the overall grade.

The timing of the provision of feedback and of the returned assessed work also contributes to making feedback effective. Specific turnaround time for feedback should be agreed and communicated with both tutors and students. Timing should allow students the opportunity to reflect on the feedback and consider how to make use of it in forthcoming assessments, taking into account the tutor's workload and ability to provide effective feedback.

### 5.4.8 Designing valid and reliable assessments

To help ensure valid and reliable assignments are designed and are consistent across all units, centres could consider a number of actions.

#### ***Use of language***

The first aspect of an assignment that a centre could focus on is ensuring that language makes tasks/questions more accessible to students.

Due consideration must be given to the command verbs (i.e. the verbs used in unit assessment criteria) when considering the Learning Outcomes of a unit. Assignments must use appropriate command verbs that equate to the demand of the Learning Outcome. If the outcome requires 'analysis' then 'evaluative' requirements within the assignment must not be set when testing that outcome. This would be viewed as over-assessing. Similarly, it is possible to under-assess where analytical demands are tested using, for example, explanatory command verbs.

The following can be used as a guide to support assignment design:

- Ensure there is a holistic understanding (by tutors and students) and use of command verbs.
- Set assignment briefs that use a single command verb, focusing on the highest level of demand expected for the Learning Outcome(s) that is (are) being tested.
- Assignments should be supported by additional guidance that helps students to interpret the demand of the assessment criteria.



- Time-constrained assessments should utilise the full range of command verbs (or acceptable equivalents) appropriate to the academic level. Modes of time-constrained assessments include in-class tests and examinations that could be both open- or closed-book. Centres should pay close consideration to ensuring tests and exams are not replicated during the course of the year.

### ***Consistency***

This relates to the consistency of presentation and structure, the consistent use of appropriate assessment language, and the consistent application of grading criteria. Where assignments are consistent, reliability is enhanced. Where validity is present in assignments this will result in assignments that are fit for purpose and provide a fair and equitable opportunity for all students to engage with the assignment requirements.

### ***Employing a range of assessment tools***

Just as variation in teaching methods used is important to the planning of a programme structure, so too is the use of a range of assessment tools appropriate to the unit and its content. Centres should consider taking a holistic view of assessment, ensuring a balanced assessment approach with consideration given to the subject being tested and what is in the best interests of students. As mentioned above, consultation with employers could add a sense of realism to an assessment strategy. (A comprehensive list of assessment tools is provided in section 6.2 *Setting effective assignments*).

No matter what tool is used, assignments should have a sector focus (whether this is in a workplace context or through a case study), and be explicitly clear in its instructions. In the absence of a case study a scenario should be used to provide some context. Finally, students should be clear on the purpose of the assignment and which elements of the unit it is targeting.

## 6 Assessment

BTEC Higher Nationals in Horticulture are assessed using a combination of internally assessed **centre-devised internal assignments** (which are set and marked by centres) and internally assessed **Pearson-set assignments** (which are set by Pearson and marked by centres). Pearson-set assignments are mandatory and target particular industry-specific skills. The number and value of these units are dependent on qualification size:

- For the HNC, one core, 15 credit, unit at Level 4 will be assessed by a mandatory Pearson-set assignment targeted at particular skills;
- For the HND, two core units: one core, 15 credit, unit at Level 4 and one core, 30 credit, unit at Level 5, will be assessed by a mandatory Pearson-set assignment targeted at particular skills;
- all other units are assessed by centre-devised internal assignments.

The purpose and rationale of having Pearson-set units on Higher Nationals is as follows:

**Standardisation of student work** – Assessing the quality of student work, that it is meeting the level and the requirements of the unit across all centres, that grade decisions and assessor feedback are justified, and that internal verification and moderation processes are picking up any discrepancies and issues.

**Sharing of good practice** – We will share good practice in relation to themes such as innovative approaches to delivery, the use of digital literacy, enhancement of student employability skills and employer engagement. **These themes will align to those for QAA Higher Education Reviews.**

An appointed External Examiner (EE) for the centre will ask to sample the Pearson-set assignment briefs in advance of the external examination visit. Although this is not a mandatory requirement for centres, we strongly advise that centres seek guidance and support from their EE on the Pearson-set assignments. The EE may also include the Pearson-set units in their sample of student work during their centre visit.

We have taken great care to ensure that the assessment method chosen is appropriate to the content of the unit and in line with requirements from professional bodies, employers and higher education.

In developing an overall plan for delivery and assessment for the programme, you will need to consider the order in which you deliver units, whether delivery will take place over short or long periods of time, and when assessment can take place.

### 6.0.1 Example Assessment Briefs

Each unit has supporting Example Assessment Briefs (EABs) that are available to download from the course materials section on our website (<http://qualifications.pearson.com/>). The EABs are there to give you an example of what the assessment will look like in terms of the feel and level of demand of the assessment.

The EABs, with the exception of the mandatory Pearson-set unit, provide tutors with suggested types of assignment and structure that can be adopted or adapted accordingly.

## 6.1 Principles of internal assessment

This section gives an overview of the key features of internal assessment and how you, as an approved Centre, can offer it effectively. The full requirements and operational information are given in the Pearson Quality Assurance Handbook available in the support section of our website (<http://qualifications.pearson.com/>). All the assessment team will need to refer to this document.

For BTEC Higher Nationals it is important that you can meet the expectations of stakeholders and the needs of students by providing a programme that is practical and applied. Centres can tailor programmes to meet local needs and should use links with local employers and the wider business sector.

When internal assessment is operated effectively it is challenging, engaging, practical and up to date. It must also be fair to all students and meet national standards.

### 6.1.1 Assessment through assignments

For internally assessed units the format of assessment is an assignment taken after the content of the unit, or part of the unit if several assignments are used, has been fully delivered. An assignment may take a variety of forms, including practical and written types. An assignment is a distinct activity completed independently by students (either alone or in a team). An assignment is separate from teaching, practice, exploration and other activities that students complete with direction from and, formative assessment by, tutors.

An assignment is issued to students as an **assignment brief** with a hand-out date, a completion date and clear requirements for the evidence that students are expected to provide. There may be specific observed practical components during the assignment period. Assignments can be divided into separate parts and may require several forms of evidence. A valid assignment will enable a clear and formal assessment outcome based on the assessment criteria.

### 6.1.2 Assessment decisions through applying unit-based criteria

Assessment decisions for BTEC Higher Nationals are based on the specific criteria given in each unit and set at each grade level. The criteria for each unit have been defined according to a framework to ensure that standards are consistent in the qualification and across the suite as a whole. The way in which individual units are written provides a balance of assessment of understanding, practical skills and vocational attributes appropriate to the purpose of the qualifications.

The assessment criteria for a unit are hierarchical and holistic. For example, if an M criterion requires the student to show 'analysis' and the related P criterion requires the student to 'explain', then to satisfy the M criterion a student will need to cover both 'explain' and 'analyse'. The unit assessment grid shows the relationships among the criteria so that assessors can apply all the criteria to the student's evidence at the same time. In *Appendix 3* we have set out a definition of terms that assessors need to understand.

Assessors must show how they have reached their decisions using the criteria in the assessment records. When a student has completed all the assessment for a unit then the assessment team will give a grade for the unit. This is given simply according to the highest level for which the student is judged to have met all the criteria. Therefore:

- **To achieve a Pass**, a student must have satisfied all the Pass criteria for the learning outcomes, showing coverage of the unit content and therefore attainment at Level 4 or 5 of the national framework.
- **To achieve a Merit**, a student must have satisfied all the Merit criteria (and therefore the Pass criteria) through high performance in each learning outcome.
- **To achieve a Distinction**, a student must have satisfied all the Distinction criteria (and therefore the Pass and Merit criteria), and these define outstanding performance across the unit as a whole.

The award of a Pass is a defined level of performance and cannot be given solely on the basis of a student completing assignments. Students who do not satisfy the Pass criteria should be reported as Unclassified.

### 6.1.3 The assessment team

It is important that there is an effective team for internal assessment. There are three key roles involved in implementing assessment processes in your centre, each with different interrelated responsibilities, and these roles are listed below. Full information is given in the Pearson Quality Assurance Handbook available in the support section of our website (<http://qualifications.pearson.com/>).

- **The Programme Leader** has overall responsibility for the programme, its assessment and internal verification to meet our requirements, record keeping and liaison with the EE. The Programme Leader registers annually with Pearson and acts as an assessor, supports the rest of the assessment team, makes sure they have the information they need about our assessment requirements, and organises training, making use of our guidance and support materials.
- **Internal Verifiers** (IVs) oversee all assessment activity in consultation with the Programme Leader. They check that assignments and assessment decisions are valid and that they meet our requirements. IVs will be standardised by working with the Programme Leader. Normally, IVs are also assessors, but they do not verify their own assessments.
- **Assessors** set or use assignments to assess students to national standards. Before taking any assessment decisions, assessors participate in standardisation activities led by the Programme Leader. They work with the Programme Leader and IVs to ensure that the assessment is planned and carried out in line with our requirements.
- Your **External Examiner** (EE) will sample student work across assessors. Your EE will also want to see evidence of internal verification of assignments and assessed decisions.

### 6.1.4 Effective organisation

Internal assessment needs to be well organised so that student progress can be tracked and so that we can monitor that assessment is being carried out in line with national standards. We support you in this through, for example, providing training materials and sample documentation. Our online HN Global service can also help support you in planning and record keeping.

It is particularly important that you manage the overall assignment programme and deadlines to make sure that all your students are able to complete assignments on time.

### 6.1.5 Student preparation

To ensure that you provide effective assessment for your students, you need to make sure that they understand their responsibilities for assessment and the centre's arrangements. From induction onwards you will want to ensure that students are motivated to work consistently and independently to achieve the requirements of the qualifications. They need to understand how assignments are used, the importance of meeting assignment deadlines, and that all the work submitted for assessment must be their own.

You will need to give your students a guide that explains:

- How assignments are used for assessment
- How assignments relate to the teaching programme
- How students should use and reference source materials, including what would constitute plagiarism.

The guide should also set out your centre's approach to operating assessments, such as how students must submit assignments/work and the consequences of submitting late work and the procedure for requesting extensions for mitigating circumstances.

## 6.2 Setting effective assessments

### 6.2.1 Setting the number and structure of assignments

In setting your assessments you need to work with the structure of assessments shown in the relevant section of a unit. This shows the learning aims and outcomes and the criteria that you are expected to follow.

Pearson provide online Example Assessment Briefs for each unit to support you in developing and designing your own assessments.

In designing your own assignment briefs you should bear in mind the following points:

- The number of assignments for a unit must not exceed the number of learning outcomes listed in the unit descriptor. However, you may choose to combine assignments, either to cover a number of learning outcomes or to create a single assignment for the entire unit.
- You may also choose to combine all or parts of different units into single assignments, provided that all units and all their associated learning outcomes are fully addressed in the programme overall. If you choose to take this approach you need to make sure that students are fully prepared, so that they can provide all the required evidence for assessment, and that you are able to track achievement in assessment records.

- A learning outcome must always be assessed as a whole and must not be split into two or more elements.
- The assignment must be targeted to the learning outcomes but the learning outcomes and their associated criteria are not tasks in themselves. Criteria are expressed in terms of the outcome shown in the evidence.

You do not have to follow the order of the learning outcomes of a unit in setting assignments, but later Learning Outcomes often require students to apply the content of earlier learning outcomes, and they may require students to draw their learning together.

Assignments must be structured to allow students to demonstrate the full range of achievement at all grade levels. Students need to be treated fairly by being given the opportunity to achieve a higher grade, if they have the ability.

As assignments provide a final assessment, they will draw on the specified range of teaching content for the learning outcomes. **The specified unit content must be taught/delivered.** The evidence for assessment need not cover every aspect of the teaching content, as students will normally be given particular examples, case studies or contexts in their assignments. For example, if a student is carrying out one practical performance, or an investigation of one organisation, then they will address all the relevant range of content that applies in that instance.

### 6.2.2 Providing an assignment brief

A good assignment brief is one that, through providing challenging and authentic sector/work-related tasks, motivates students to provide appropriate evidence of what they have learnt.

An assignment brief should have:

- A vocational scenario: this could be a simple situation or a full, detailed set of vocational requirements that motivates the student to apply their learning through the assignment.
- Clear instructions to the student about what they are required to do, normally set out through a series of tasks.
- An audience or purpose for which the evidence is being provided.
- An explanation of how the assignment relates to the unit(s) being assessed.

### 6.2.3 Forms of evidence

BTEC Higher Nationals have always allowed for a variety of forms of assessment evidence to be used, provided they are suited to the type of learning outcomes being assessed. For many units, the practical demonstration of skills is necessary and, for others, students will need to carry out their own research and analysis, working independently or as part of a team.

The EABs give you information on what would be suitable forms of evidence to give students the opportunity to apply a range of employability or transferable skills. Centres may choose to use different suitable forms of evidence to those proposed. Overall, students should be assessed using varied forms of evidence.

These are some of the main types of assessment:

- Written reports, essays
- In-class tests
- Examinations
- Creation of financial documents
- Creation of planning documents
- Work-based projects
- Academic posters, displays, leaflets
- PowerPoint (or similar) presentations
- Recordings of interviews/role plays
- Working logbooks, reflective journals
- Presentations with assessor questioning
- Time-constrained assessment.

(Full definitions of different types of assessment are given in *Appendix 4*.)

The form(s) of evidence selected must:

- Allow the student to provide all the evidence required for the learning outcomes and the associated assessment criteria at all grade levels.
- Allow the student to produce evidence that is their own independent work.
- Allow a verifier to independently reassess the student to check the assessor's decisions.

For example, when you are using performance evidence, you need to think about how supporting evidence can be captured through recordings, photographs or task sheets.

Centres need to take particular care that students are enabled to produce independent work. For example, if students are asked to use real examples, then best practice would be to encourage them to use examples of their own or to give the group a number of examples that can be used in varied combinations.



## 6.3 Making valid assessment decisions

### 6.3.1 Authenticity of student work

An assessor must assess only student work that is authentic, i.e. the student's own independent work. Students must authenticate the evidence that they provide for assessment through signing a declaration stating that it is their own work. A student declaration must state that:

- Evidence submitted for the assignment is the student's own
- The student understands that false declaration is a form of malpractice.

Assessors must ensure that evidence is authentic to a student through setting valid assignments and supervising them during the assessment period. Assessors must also take care not to provide direct input, instructions or specific feedback that may compromise authenticity.

Centres may use Pearson templates or their own templates to document authentication.

During assessment an assessor may suspect that some or all of the evidence from a student is not authentic. The assessor must then take appropriate action using the centre's policies for malpractice. (See *section 3.7* in this Programme Specification for further information.)

### 6.3.2 Making assessment decisions using criteria

Assessors make judgements using the criteria. The evidence from a student can be judged using all the relevant criteria at the same time. The assessor needs to make a judgement against each criterion that evidence is present and sufficiently comprehensive. For example, the inclusion of a concluding section may be insufficient to satisfy a criterion requiring 'evaluation'.

Assessors should use the following information and support in reaching assessment decisions:

- The explanation of key terms in *Appendix 3* of this document
- Examples of verified assessed work
- Your Programme Leader and assessment team's collective experience.

### 6.3.3 Dealing with late completion of assignments

Students must have a clear understanding of the centre's policy on completing assignments by the deadlines that you give them. Students may be given authorised extensions for legitimate reasons, such as illness, at the time of submission, in line with your centre policies (see also *Section 3.6 "Administrative arrangements for internal assessment"*).

For assessment to be fair, it is important that students are all assessed in the same way and that some students are not advantaged by having additional time or the opportunity to learn from others. Centres should develop and publish their own regulations on late submission; and, this should make clear the relationship between late submission and the centre's mitigating circumstances policy.

Centres may apply a penalty to assignments that are submitted beyond the published deadline. However, if a late submission is accepted, then the assignment should be assessed normally, when it is submitted, using the relevant assessment criteria; with any penalty or cap applied after the assessment. Where the result of assessment may be capped, due to late submission of the assignment, the student should be given an indication of their uncapped grade; in order to recognise the learning that has been achieved, and assessment feedback should be provided in relation to the uncapped achievement.

As with all assessment results, both the uncapped and capped grades should be recorded and ratified by an appropriate assessment board; taking into account any mitigating circumstances that may have been submitted.

### 6.3.4 Issuing assessment decisions and feedback

Once the assessment team has completed the assessment process for an assignment, the outcome is a formal assessment decision. This is recorded formally and reported to students. The information given to the student:

- Must show the formal decision and how it has been reached, indicating how or where criteria have been met.
- May show why attainment against criteria has not been demonstrated.
- Must not provide feedback on how to improve evidence but how to improve in the future.

### 6.3.5 Resubmission opportunity

An assignment provides the final assessment for the relevant learning outcomes and is normally a final assessment decision. A student who, for the first assessment opportunity, has failed to achieve a Pass for that unit specification **shall be expected to undertake a reassessment**.

- Only one opportunity for reassessment of the unit will be permitted.
- Reassessment for course work, project- or portfolio-based assessments shall normally involve the reworking of the original task.
- For examinations, reassessment shall involve completion of a new task.
- A student who undertakes a reassessment will have their grade capped at a Pass for that unit.
- A student will not be entitled to be reassessed in any component of assessment for which a Pass grade or higher has already been awarded.

### 6.3.6 Repeat Units

A student who, for the first assessment opportunity and resubmission opportunity, still failed to achieve a Pass for that unit specification can:

- At Centre discretion and Assessment Board, decisions can be made to permit a repeat of a unit.
- The student must study the unit again with full attendance and payment of the unit fee.
- The overall unit grade for a successfully completed repeat unit is capped at a Pass for that unit.
- Units can only be repeated once.

### 6.3.7 Assessment Boards

Each centre is expected by Pearson to hold Assessment Boards for all of its BTEC Higher National programmes. The main purpose of an Assessment Board is to make recommendations on:

- The grades achieved by students on the individual units
- Extenuating circumstances
- Cases of cheating and plagiarism
- Progression of students on to the next stage of the programme
- The awards to be made to students
- Referrals and deferrals.

Assessment Boards may also monitor academic standards. The main boards are normally held at the end of the session, although if your centre operates on a semester system there may be (intermediate) boards at the end of the first semester. There may also be separate boards to deal with referrals.

Where a centre does not currently have such a process then the EE should discuss this with the Quality Nominee and Programme Leader, stressing the requirement for Assessment Boards by both Pearson and QAA and that Assessment Board reports and minutes provide valuable evidence for QAA's Review of Higher Education process.

## **6.4 Planning and record keeping**

For internal processes to be effective, an assessment team needs to be well organised and keep effective records. The centre will also work closely with us so that we can quality assure that national standards are being satisfied. This process gives stakeholders confidence in the assessment approach.

The Programme Leader should have an assessment plan. When producing a plan the assessment team will wish to consider:

- The time required for training and standardisation of the assessment team.
- The time available to undertake teaching and carrying out of assessment, taking account of when students may complete external assessments and when quality assurance will take place.
- The completion dates for different assignments.
- Who is acting as IV for each assignment and the date by which the assignment needs to be verified.
- Setting an approach to sampling assessor decisions though internal verification that covers all assignments, assessors and a range of students.
- How to manage the assessment and verification of students' work, so that they can be given formal decisions promptly.
- How resubmission opportunities can be scheduled.

The Programme Leader will also maintain records of assessment undertaken. The key records are:

- Verification of assignment briefs
- Student authentication declarations
- Assessor decisions on assignments, with feedback given to students
- Verification of assessment decisions.

Examples of records and further information are available in the Pearson Quality Assurance Handbook available in the support section of our website (<http://qualifications.pearson.com>).

## 6.5 Calculation of the final qualification grade

### 6.5.1 Conditions for the award

#### Conditions for the award of the HND

To achieve a Pearson BTEC Level 5 Higher National Diploma qualification a student must have:

- completed units equivalent to 120 credits at level 5
- achieved at least a pass in 105 credits at level 5
- completed units equivalent to 120 credits at level 4
- achieved at least a pass in 105 credits at level 4.

#### Conditions for the award of the HNC

To achieve a Pearson BTEC Level 4 Higher National Certificate qualification a student must have:

- completed units equivalent to 120 credits at level 4
- achieved at least a pass in 105 credits at level 4.

### 6.5.2 Compensation provisions

#### Compensation provisions for the HND

Students can still be awarded an HND if they have attempted but not achieved a Pass in one of the 15-credit units completed at level 4, and similarly if they have attempted but not achieved a Pass in one of the 15-credit units at level 5. However, they must complete and pass the remaining units for an HNC or HND as per the unit rules of combination of the required qualification.

#### Compensation provisions for the HNC

Students can still be awarded an HNC if they have attempted but not achieved a Pass in one of the 15-credit units completed, but have completed and passed the remaining units.

### 6.5.3 Calculation of the overall qualification grade

The calculation of the **overall qualification grade** is based on the student's performance in all units. Students are awarded a Pass, Merit or Distinction qualification grade, using the points gained through all 120 credits, at Level 4 for the HNC or Level 5 for the HND, based on unit achievement. The overall qualification grade is calculated in the same way for the HNC and for the HND.

All units in valid combination must have been attempted for each qualification. The conditions of award and the compensation provisions will apply as outlined above. All 120 credits count in calculating the grade (at each level, as applicable).

The overall qualification grade for the HND will be calculated based on student performance in Level 5 units only.

Units that have been attempted but not achieved, and subsequently granted compensation, will appear as 'Unclassified', i.e. a 'U' grade, on the student's Notification of Performance, that is issued with the student certificate.

#### Points per credit

Grade	Points
Pass	4
Merit	6
Distinction	8

#### Point boundaries

Grade	Point boundaries
Pass	420–599
Merit	600–839
Distinction	840 +

## 6.5.4 Modelled student outcomes

### Pearson BTEC Level 4 Higher National Certificate

				STUDENT 1		STUDENT 2		STUDENT 3		STUDENT 4		STUDENT 5	
	Credits	Level	Grade point	Grade	Unit points	Grade	Unit points	Grade	Unit points	Grade	Unit points	Grade	Unit points
Core 1	15	4	4	P	60	P	60	P	60	D	120	D	120
Core 2	15	4	4	P	60	P	60	P	60	D	120	M	90
Core 3	15	4	4	P	60	P	60	P	60	D	120	M	90
Core 4	15	4	4	P	60	P	60	M	90	M	90	M	90
Core 5	15	4	6	M	90	P	60	M	90	M	90	M	90
Core 6	15	4	6	M	90	P	60	M	90	M	90	M	90
Opt 1	15	4	6	M	90	M	90	D	120	D	120	D	120
Opt 2	15	4	6	M	90	M	90	D	120	D	120	D	120
TOTAL	120				600		540		690		870		810
GRADE					M		P		M		D		M

### Pearson BTEC Level 5 Higher National Diploma

				STUDENT 1		STUDENT 2		STUDENT 3		STUDENT 4		STUDENT 5	
	Credits	Level	Grade point	Grade	Unit points	Grade	Unit points	Grade	Unit points	Grade	Unit points	Grade	Unit points
Core 1	15	4	0	P	0	P	0	P	0	D	0	P	0
Core 2	15	4	0	P	0	P	0	P	0	D	0	M	0
Core 3	15	4	0	P	0	P	0	P	0	D	0	M	0
Core 4	15	4	0	P	0	P	0	M	0	M	0	M	0
Core 5	15	4	0	M	0	P	0	M	0	M	0	P	0
Core 6	15	4	0	M	0	P	0	M	0	D	0	U	0
Opt 1	15	4	0	M	0	P	0	D	0	D	0	D	0
Opt 2	15	4	0	M	0	P	0	D	0	D	0	D	0
Core 7	30	5	6	M	180	M	180	M	180	P	120	D	240
Core 8	15	5	6	M	90	M	90	M	90	P	60	D	120
Opt 3	15	5	6	M	90	M	90	D	120	P	60	D	120
Opt 4	15	5	6	M	90	P	60	D	120	P	60	D	120
Opt 5	15	5	6	M	90	P	60	D	120	M	90	M	90
Opt 6	15	5	6	M	90	P	60	M	90	M	90	P	60
Opt 7	15	5	6	M	90	P	60	M	90	M	90	M	90
TOTAL	240				720		600		810		570		840
GRADE					M		M		M		P		D

Opt = Optional

## 7 Quality assurance

Pearson's quality assurance system for all Pearson BTEC Higher National programmes is benchmarked to Level 4 and Level 5 on the Quality Assurance Agency (QAA) Framework for Higher Education Qualifications (FHEQ). This will ensure that centres have effective quality assurance processes to review programme delivery. It will also ensure that the outcomes of assessment are to national standards.

The quality assurance process for centres offering Pearson BTEC Higher National programmes comprise five key components:

- 1 The approval process
- 2 Monitoring of internal centre systems
- 3 Independent assessment review
- 4 Annual programme monitoring report
- 5 Annual student survey

### 7.1 The approval process

Centres new to the delivery of Pearson programmes will be required to seek approval initially through the existing centre approval process and then through the programme approval process. Programme approval for new centres can be considered in one of two ways:

- Desk-based approval review
- Review and approval visit to the centre.

Prior to approval being given, centres will be required to submit evidence to demonstrate that they:

- Have the human and physical resources required for effective delivery and assessment.
- Understand the implications for independent assessment and agree to abide by these.
- Have a robust internal assessment system supported by 'fit for purpose' assessment documentation.
- Have a system to internally verify assessment decisions, to ensure standardised assessment decisions are made across all assessors and sites.

Applications for approval must be supported by the head of the centre (Principal or Chief Executive, etc.) and include a declaration that the centre will operate the programmes strictly, as approved and in line with Pearson requirements.



Centres seeking to renew their programme approval upon expiry of their current approval period may be eligible for the Automatic Approval process, subject to the centre meeting the eligibility criteria set out by Pearson.

Regardless of the type of centre, Pearson reserves the right to withdraw either qualification or centre approval when it deems there is an irreversible breakdown in the centre's ability either to quality assure its programme delivery or its assessment standards.

## 7.2 Monitoring of internal Centre systems

Centres will be required to demonstrate on-going fulfilment of the centre approval criteria over time and across all Higher National programmes. The process that assures this is external examination, which is undertaken by EEs. Centres will be given the opportunity to present evidence of the on-going suitability and deployment of their systems to carry out the required functions. This includes the consistent application of policies affecting student registrations, appeals, effective internal examination and standardisation processes. Where appropriate, centres may present evidence of their operation within a recognised code of practice, such as that of the QAA for Higher Education. Pearson reserves the right to confirm independently that these arrangements are operating to Pearson's standards.

Pearson will affirm, or not, the on-going effectiveness of such systems. Where system failures are identified, sanctions (appropriate to the nature of the problem) will be applied, in order to assist the centre in correcting the problem.

## 7.3 Independent assessment review

The internal assessment outcomes reached for all Pearson BTEC Higher National programmes benchmarked to Level 4 and Level 5 of the QAA's FHEQ, are subject to a visit from a Pearson appointed External Examiner. The outcomes of this process will be:

- To confirm that internal assessment is to national standards and allow certification, **or**
- To make recommendations to improve the quality of assessment outcomes before certification is released, **or**
- To make recommendations about the centre's ability to continue to be approved for the Pearson BTEC Higher National qualifications in question.

## **7.4 Annual Programme Monitoring Report (APMR)**

The APMR is a written annual review form that provides opportunity for centres to analyse and reflect on the most recent teaching year. By working in collaboration with centres, the information can be used by Pearson to further enhance the quality assurance of the Pearson BTEC Higher National programmes.

## **7.5 Annual student survey**

Pearson will conduct an annual survey of Pearson BTEC Higher National students. The purpose of the survey is to enable Pearson to evaluate the student experience as part of the quality assurance process, by engaging with students studying on these programmes.

## **7.6 Centre and qualification approval**

As part of the approval process, your centre must make sure that the resource requirements listed below are in place before offering the qualification.

Centres must have appropriate physical resources (for example equipment, IT, learning materials, teaching rooms) to support the delivery and assessment of the qualifications.

- Staff involved in the assessment process must have relevant expertise and/or occupational experience.
- There must be systems in place to ensure continuing professional development for staff delivering the qualification.
- Centres must have in place appropriate health and safety policies relating to the use of equipment by staff and students.
- Centres must deliver the qualification in accordance with current equality legislation.
- Centres should refer to the individual unit descriptors to check for any specific resources required.
- The result, we believe, are qualifications that will meet the needs and expectations of students worldwide.

## **7.7 Continuing quality assurance and standards verification**

We produce annually the latest version of the Pearson Quality Assurance Handbook available in the support section of our website (<http://qualifications.pearson.com>). It contains detailed guidance on the quality processes required to underpin robust assessment and internal verification.

The key principles of quality assurance are that:

- A centre delivering Pearson BTEC Higher National programmes must be an approved centre, and must have approval for the programmes or groups of programmes that it is delivering.
- The centre agrees, as part of gaining approval, to abide by specific terms and conditions around the effective delivery and quality assurance of assessment; it must abide by these conditions throughout the period of delivery.
- Pearson makes available to approved centres a range of materials and opportunities through the assessment checking service. This is intended to exemplify the processes required for effective assessment and provide examples of effective standards. Approved centres must use the materials and services to ensure that all staff delivering BTEC qualifications keep up to date with the guidance on assessment.
- An approved centre must follow agreed protocols for standardisation of assessors and verifiers, for the planning, monitoring and recording of assessment processes, and for dealing with special circumstances, appeals and malpractice.

The approach of quality-assured assessment is through a partnership between an approved centre and Pearson. We will make sure that each centre follows best practice and employs appropriate technology to support quality-assurance processes where practicable. We work to support centres and seek to make sure that our quality-assurance processes do not place undue bureaucratic processes on centres. We monitor and support centres in the effective operation of assessment and quality assurance.

The methods we use to do this for BTEC Higher Nationals include:

- Making sure that all centres complete appropriate declarations at the time of approval
- Undertaking approval visits to centres
- Making sure that centres have effective teams of assessors and verifiers who are trained to undertake assessment
- Assessment sampling and verification through requested samples of assessments, completed assessed student work and associated documentation
- An overarching review and assessment of a centre's strategy for assessing and quality-assuring its BTEC programmes.

An approved centre must make certification claims only when authorised by us and strictly in accordance with requirements for reporting. Centres that do not fully address and maintain rigorous approaches to quality assurance cannot seek certification for individual programmes or for all BTEC Higher National qualifications.

Centres that do not comply with remedial action plans may have their approval to deliver qualifications removed.

## 8 Recognition of Prior Learning and attainment

Recognition of Prior Learning (RPL) is a method of assessment (leading to the award of credit) that considers whether students can demonstrate that they can meet the assessment requirements for a unit through knowledge, understanding or skills they already possess, and so do not need to develop through a course of learning.

Pearson encourages centres to recognise students' previous achievements and experiences whether at work, home or at leisure, as well as in the classroom. RPL provides a route for the recognition of the achievements resulting from continuous learning. RPL enables recognition of achievement from a range of activities using any valid assessment methodology. Provided that the assessment requirements of a given unit or qualification have been met, the use of RPL is acceptable for accrediting a unit, units or a whole qualification. Evidence of learning must be valid and reliable.

For full guidance on RPL please refer to the Recognition of Prior Learning policy document available in the support section of our website (<https://qualifications.pearson.com>).

## 9 Equality and diversity

Equality and fairness are central to our work. The design of these qualifications embeds consideration of equality and diversity as set out in the qualification regulators' General Conditions of Recognition. Promoting equality and diversity involves treating everyone with equal dignity and worth, while also raising aspirations and supporting achievement for people with diverse requirements, entitlements and backgrounds. An inclusive environment for learning anticipates the varied requirements of students, and aims to ensure that all students have equal access to educational opportunities. Equality of opportunity involves enabling access for people who have differing individual requirements as well as eliminating arbitrary and unnecessary barriers to learning. In addition, students with and without disabilities are offered learning opportunities that are equally accessible to them, by means of inclusive qualification design.

Pearson's equality policy requires all students to have equal opportunity to access our qualifications and assessments. It also requires our qualifications to be designed and awarded in a way that is fair to every student. We are committed to making sure that:

- Students with a protected characteristic (as defined in legislation) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to students who do not share that characteristic.
- All students achieve the recognition they deserve from undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.
- Pearson's policy regarding access to its qualifications is that:
- They should be available to everyone who is capable of reaching the required standards
- They should be free from any barriers that restrict access and progression
- There should be equal opportunities for all those wishing to access the qualifications.

Centres are required to recruit students to Higher National qualifications with integrity. This will include ensuring that applicants have appropriate information and advice about the qualifications, and that the qualification will meet their needs. Centres will need to review the entry profile of qualifications and/or experience held by applicants, considering whether this profile shows an ability to progress to a higher level qualification. Centres should take appropriate steps to assess each applicant's potential and make a professional judgement about their ability to successfully complete the programme of study and achieve the qualification. This assessment will need to take account of the support available to the student within the centre during their programme of study and any specific support that might be necessary to allow the student to access the assessment for the qualification. Centres should consult our policy documents on students with particular requirements.

### **Access to qualifications for students with disabilities or specific needs**

Students taking a qualification may be assessed in a recognised regional sign language, where it is permitted for the purpose of reasonable adjustments. Further information on access arrangements can be found in the Joint Council for Qualifications (JCQ) document Access Arrangements, Reasonable Adjustments and Special Consideration for General and Vocational Qualifications. Details on how to make adjustments for students with protected characteristics are given in the document *Pearson Supplementary Guidance for Reasonable Adjustment and Special Consideration in Vocational Internally Assessed Units*. See the support section of our website for both documents (<http://qualifications.pearson.com/>).

## 10 Higher Nationals Horticulture Units

# Unit 1: Principles of Botany

<b>Unit code</b>	<b>Y/616/8045</b>
<b>Unit type</b>	<b>Core</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

## Introduction

Botany is the scientific study of plants. Plants represent one of the most diverse of all kingdoms and in this unit students will develop their knowledge and understanding of the organisms that make up the kingdom Plantae and its subgroupings (Thallophyta, Bryophyta, Pteridophyta, Gymnosperms and Angiosperms). By this definition, plants include herbs, shrubs, trees, creepers, climbers, aquatic plants, desert plants, mountain plants, flowering and non-flowering plants. The unit will form the essential knowledge and understanding that will be required of students across a wide range of scientific disciplines and is closely linked to other units in the qualification.

The purpose of this unit is to enable students to develop a thorough understanding of the role of plants and the relationship they have with humans.

Students will study the interrelationship that plants have between themselves, their environments and other organisms. They will research and evaluate the role of plants as energy sources for all living organisms and will apply the fundamentals of plant anatomy and physiology. Plant structure and function will also form a key part of the unit and students will investigate botanical research into how the importance of plants is being continuously recognised in the fields of pharmacology, medicine, food, construction and biodiversity conservation.

Students will develop a thorough understanding of plant anatomy and physiology through laboratory-based practical work and will be able to assess the contribution that plants make to human societies.



## **Learning Outcomes**

By the end of this unit students will be able to:

1. Assess the role of plants as energy sources for all living organisms
2. Demonstrate the fundamental principles of plant anatomy, physiology and morphology
3. Analyse the evolutionary and ecological relationships between plants
4. Describe the relationship between plants and human.

## Essential content

### LO1 **Assess the role of plants as energy sources for all living organisms**

*Physiological processes:*

Cell division

Photosynthesis

Respiration

Transpiration

Osmosis

Nutrient function in plants and their absorption

Short and long-distance transport systems within plants Experimentation and evaluation of results.

### LO2 **Demonstrate the fundamental principles of plant anatomy, physiology and morphology**

*Plant structure and function:*

Anatomy and morphology

Growth and function of plant cells, tissues and organs

Cell division

Cell differentiation root and shoot relationships (structure and function)

Stems, leaves, flowers, fruits (structure and function)

Hormonal control of whole plant growth and development Germination and seedling growth

Responses to stress factors

Plant reproduction

Undertake laboratory practical tasks associated with plant anatomy and physiology e.g. develop controlled experiments and randomised trials, present and interpret results, carry out statistical analysis of results.

### LO3 **Analyse the evolutionary and ecological relationships between plants**

*Plant evolution and classification:*

Prokaryotes and eukaryotes

Differences in cells

Evolutionary theory

Plant classification e.g. non-vascular and vascular plants

Plant classification e.g. non-flowering and flowering plants

Ecological relationships between plants e.g. plants in ecosystems and biomes

Global distribution of the main plant families

Adaptations of plants to their environments.

### LO4 **Describe the relationship between plants and humans.**

*Uses of plants and human/plant relationships:*

Food

Medicine

Construction

Industry fibre

Plant derived commodities

Economic value of plants e.g. cash and future markets

Ecosystem services e.g. regulation of water cycle

Water purification and filtration

Sustainable flood control in urban areas

Gaseous exchange and regulation of oxygen and carbon dioxide  
Plants as carbon stores

Aesthetic and cultural uses of plants, historical context to the use of plants.

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>L01</b> Assess the role of plants as energy sources for all living organisms			<b>L01 L02</b>  <b>D1</b> Present the results of own laboratory experiments carried out in P1 and P2, and M1 and M2, with detailed statistical analysis.
<b>P1</b> Explain the fundamental processes by which plants acquire energy and mass.	<b>M1</b> Discuss the relationship between plant physiological processes to the practice of plant production.		
<b>L02</b> Demonstrate the fundamental principles of plant anatomy, physiology and morphology			
<b>P2</b> Perform laboratory experiments to investigate the principles of plant anatomy, physiology and morphology.	<b>M2</b> Interpret the results of laboratory experiments with accuracy.		
<b>L03</b> Analyse the evolutionary and ecological relationships between plants.			<b>D2</b> Critically evaluate the ecological role of plants in the Earth's major biomes.
<b>P3</b> Investigate the fundamental differences between the major plant groups.  <b>P4</b> Justify the classification of a range of plants from the major plant families.	<b>M3</b> Analyse the evolutionary adaptations of xerophytic, hydrophytic and mesophytic plants.		
<b>L04</b> Describe the relationship between plants and humans.			<b>D3</b> Critically evaluate the future role of plants in current food security, environmental protection and ecosystem services.
<b>P5</b> Describe the historical and present relationship between plants and humans.	<b>M4</b> Explain the significance of plant structures in relation to their use in a selected industry.		

## Recommended resources

### Textbooks

ACQUAAH, G. (2012) *Principles of Plant Genetics and Breeding*. Chichester: Wiley Blackwell Publishing.

GRAHAM, L.E., GRAHAM, J.M. and WILCOX, L.W. (2006) *Plant Biology*. New Jersey: Prentice Hall.

NABORS, M.W. (2004) *Introduction to Botany*. New York: Pearson.

SLATER, A. (2008) *Plant Biotechnology: The Genetic Manipulation of Plants*. Oxford: Oxford University Press.

TAIZ, L. and EDUARDO, Z. (2014) *Plant Physiology and Development*. Sunderland: Sinauer Associates.

TAIZ, L. and EDUARDO, Z. (2010) *Plant Physiology: International Edition*. Sunderland: Sinauer Associates.

UNO, G.R., STOREY, R. and MOORE, R. (2001) *Principles of Botany*. Illinois: McGraw Hill.

### Websites

www.academic.oup.com	Oxford Academic Journals Annals of Botany (Journal)
www.academic.oup.com	Oxford Academic Journals Journal of Experimental Botany (Journal)
www.hindawi.com	Hindawi Journal of Botany (Journal)
www.ingentaconnect.com	Ingenta Connect Systemic Botany (Journal)
www.journals.uchicago.edu	University of Chicago Press Journals International Journal of Plant Sciences (Journal)

[www.onlinelibrary.wiley.com](http://www.onlinelibrary.wiley.com)

Wiley Online Library

Botanical Journal of the Linnean Society  
(Journal)

[www.tandfonline.com](http://www.tandfonline.com)

Taylor Francis Online

New Journal of Botany Journal of the  
Botanical Society of Great Britain and Ireland  
(Journal)

## Links

This unit links to the following related units:

*Unit 4: Plant and Soil Science*

*Unit 6: Principles of Crop Production*

*Unit 7: Plant and Crop Nutrition*

*Unit 15: Plant Selection and Propagation*

## Unit 2: Business and the Business Environment

<b>Unit code</b>	<b>L/616/7829</b>
<b>Unit type</b>	<b>Core</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

### Introduction

The aim of this unit is to provide students with background knowledge and understanding of Land-based business, the functions of an organisation and the wider business environments in which organisations operate. Students will examine the different types of Land-based organisations (including for-profit and not-for-profit), their size and scope (for instance, micro, SME, transnational and global), and how they operate.

Students will explore the relationships that Land-based organisations have with their various stakeholders and how the wider external environments influence and shape business decision-making.

The knowledge, understanding and skill sets gained in this unit will help students to choose their own preferred areas of specialism in future studies and in their professional career.

## **Learning Outcomes**

By the end of this unit a student will be able to:

1. Explain the different types, size and scope of Land-based organisations
2. Demonstrate the interrelationship of the various functions within a Land-based organisation and how they link to organisational structure
3. Use contemporary examples to demonstrate both the positive and negative influence/impact the macro environment has on Land-based business operations
4. Determine the internal strengths and weaknesses of specific Land-based businesses and explain their interrelationship with external macro factors.



## Essential Content

### LO1 Explain the different types, size and scope of Land-based organisations

#### *Different types of organisations:*

Differences between for-profit and not-for-profit and non-government organisations (NGOs)

Micro, small, medium-sized enterprises (SMEs) e.g. different business purposes, objectives and supply of goods and services

The range of legal structures associated with different forms of business e.g. sole traders, partnerships and private limited companies.

#### *Size and scope of organisations:*

Differences between large, medium-sized and small organisations e.g. objectives and goals, market share, profit share, growth and sustainability

Global growth and developments of transnational, international and global organisations

Differences between franchising, joint ventures and licensing

Industrial structures and competitive analysis

Market forces and economic operations e.g. scarcity and choice, supply and demand, income elasticity

Stakeholders and responsibilities of organisations to meet different stakeholder interests and expectations.

### LO2 Demonstrate the interrelationship of the various functions within a Land-based organisation and how they link to organisational structure

#### *The various functions within an organisation:*

The role of marketing, finance, human resource management and operations within an organisational context and the interrelationships

How functions relate to overall organisation mission and objectives.

#### *Organisational structure:*

Different structures depending upon the size and scope of the organisation e.g. bureaucratic and post-bureaucratic, parent, strategic business units (SBUs), matrix and functional levels

Organisation structures and complexities of transnational, international and global organisations.

**LO3 Use contemporary examples to demonstrate both the positive and negative influence/impact the macro environment has on Land-based business operations**

*The context of the macro environment:*

The application of the PESTLE framework and how organisations need to monitor and forecast external influences

How the macro environment influences/impacts upon business activities e.g. the impact of the digital revolution on production and consumption, the impact of social technologies, cybersecurity, emerging BRICS markets, the global shift in economic and social power, and ethical and sustainable growth

How organisations go through the transformation process and overcome resistance to change in response to the changing market environment.

**LO4 Determine the internal strengths and weaknesses of specific Land-based businesses and explain their interrelationship with external macro factors.**

*Frameworks for analysis:*

Introduction to SWOT and/or TOWS analysis and how they can assist in the decision-making process within organisations

Key external macro factors e.g. the competitive environment and government intervention that influence organisations and business.

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>L01</b> Explain the different types, size and scope of Land-based organisations			<b>L01 L02</b>  <b>D1</b> Provide a critical analysis of the complexities of different types of business structures and the interrelationships of the different organisational functions.
<b>P1</b> Explain different types and purposes of Land-based organisations, public, private and voluntary sectors and legal structures.  <b>P2</b> Explain the size and scope of a range of different types of Land-based organisations.	<b>M1</b> Analyse how the structure, size and scope of different Land-based organisations link to the business objectives and products and services offered by the organisation.		
<b>L02</b> Demonstrate the interrelationship of the various functions within a Land-based organisation and how they link to organisational structure.			
<b>P3</b> Explain the relationship between different organisational functions and how they link to organisational objectives and structure.	<b>M2</b> Analyse the advantages and disadvantages of interrelationships between organisational functions and the impact that can have upon organisational structure.		<b>L03 L04</b>  <b>D2</b> Critically evaluate the impacts that both macro and micro factors have upon business objectives and decision-making.
<b>L03</b> Use contemporary examples to demonstrate both the positive and negative influence/impact the macro environment has on Land-based business operations.			
<b>P4</b> Identify the positive and negative impacts the macro environment has upon business operations, supported by specific examples.	<b>M3</b> Appropriately apply the PESTLE model to support a detailed analysis of the macro environment within a Land-based organisation.		

Pass	Merit	Distinction
<b>L04</b> Determine the internal strengths and weaknesses of specific Land-based businesses and explain their interrelationship with external macro factors.		
<b>P5</b> Conduct internal and external analysis of specific Land-based organisations in order to identify strengths and weaknesses.	<b>M4</b> Appropriately apply SWOT/TOWS analysis and justify how they influence decision-making.	
<b>P6</b> Explain how strengths and weaknesses interrelate with external macro factors.		

## Recommended Resources

### Textbooks

BARON, P. (2012) *Business and Its Environment*. 7th edn. London: Prentice Hall.

PALMER, A. and HARTLEY, B. (2011) *The Business Environment*. 7th edn. Maidenhead: McGraw-Hill.

WEATHERLEY, P. and OTTER, D. (2014) *The Business Environment: Themes and Issues in a Globalised World*. 3rd edn. Oxford: Oxford University Press.

WORTHINGTON, I. and BRITTON, C. (2014) *The Business Environment*. 7th edn. Harlow: Pearson.

### Links

This unit links to the following related units:

*Unit 11: Human Resource Management*

*Unit 12: Marketing Essentials*

*Unit 13: Management Accounting*

## Unit 3: Plant Identification and Classification

<b>Unit code</b>	<b>D/616/8046</b>
<b>Unit type</b>	<b>Core</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Plant identification is an essential part of horticulture and many other disciplines in the Land-based sector. Plants form the basis of all of the Earth's ecosystems and all life on Earth depends on plants. The study of plants therefore encompasses a huge range of inter-related scientific disciplines. As such, researchers, producers and retailers in agriculture, horticulture and conservation biology need to develop skills and understanding in plant identification and classification.

In this unit, students will learn about the wide range of plant types and species, and will be introduced to the concept of nomenclature. They will develop the skills needed to identify a range of important plant families and species and to recognise plant types and forms.

Plant classification and taxonomy features strongly throughout the unit and students will be able to recognise the characteristics of the main plant groups. The use of identification keys and of Latin as a common language for plant nomenclature will provide a strong vocational element to this unit and students will develop their confidence in articulating and recording plant species. The Learning Outcomes reflect the skills and knowledge that are currently required by commercial breeders, professional horticulturists, the agricultural sector and those working in the environmental field. An introduction to plant legislation will also enable students to appreciate the international context of plant breeding and collections.

On completion of the unit, students will have confidence in their ability to identify plants from a wide range of families using a variety of identification systems.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Manage the identification and classification of plants
2. Identify and classify plants
3. Assess how to manage the identification and classification of plants
4. Analyse the legislative implications relating to managing the identification and classification of plants.

## Essential content

### LO1 Manage the identification and classification of plants

*Plant nomenclature:*

Family

Genus

Species

Subspecies

Variety

Cultivar

Form

Synonyms

Management e.g. responsible plant sourcing, concepts of sustainability, liaison with relevant organisations, effective use of plant collections to promote sites and engage communities, interpretation, historic significance, events, a range of genera and species, increasing awareness and access to plants on-site, management of native flora and fauna, management of competition, plant pests, disease invasion and action to control

Plant recording e.g. purpose and requirements, recording systems, ledgers, index cards, paper forms, notebooks, use of spreadsheets, national databases, use of International Transfer Format for Botanic Gardens Plant Records (ITF), labelling

Plants e.g. evergreens, conifers, deciduous, coastal, native and exotic trees and shrubs, herbaceous, perennials, annuals, shade tolerant and woodland plants, aquatic species, alpiners, arid and ephemerals, native and non-native, invasive species.



## LO2 **Identify and classify plants**

*Use of plant keys:*

Online keys

Random or multi-access keys

Dichotomous keys

Specialist textbooks

Visual guides

AIDGAP keys (Aid to the Identification of Difficult Groups of Animals and Plants)

Use of glossaries and specialist language

Use of Latin as international language

Use of the binomial system.

## LO3 **Assess how to manage the identification and classification of plants**

*Relevant organisations and the use of Latin as international language:*

National Council for the Conservation of Plants and Gardens (NCCPG) Royal Botanical Gardens, Kew

Botanic Gardens Conservation International (BGCI)

Royal Botanic Garden, Edinburgh

National Institute of Agricultural Botany (NIAB)

The National Arboretum, Westonbirt

International Plant Exchange Network (IPN)

Plantlife

National Botanic Gardens of Wales

Plant naming e.g. use of the binomial system, Linnaean system, Angiosperm Phylogeny Group (APG), difficulties of common names and regional variations

Identification

Use of plant collections

Arboretums

Plant collection organisation

Herbariums and their purpose

Plant collectors.

**LO4 Analyse the legislative implications relating to managing the identification and classification of plants.**

*Legislation:*

Convention on International Trade in Endangered Species of Wild Fauna and Flora

Convention on Biological Diversity (CBD)

Invasive Species Legislation

Wildlife and Countryside Act 1981

Countryside and Rights of Way Act 2000

Biodiversity Action Plans.

*Plant registration:*

Systems and requirements

Plant Breeder's Rights (PBR)

Plant Variety Rights Office.

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
LO1 Manage the identification and classification of plants.			LO1 LO2  D1 Evaluate plant collections and horticultural practices and their impact on wild flora and fauna.
P1 Discuss plant species within a selected site including common flora.	M1 Discuss the heritage, conservation and amenity value of plants on-site.		
P2 Describe and select a plant record system appropriate to a site.			
P3 Assess any invasive species and recommend appropriate action.			
LO2 Identify and classify plants			
P4 Select plant identification and classification keys.	M2 Classify 200 plants taxonomically.		
P5 Explain plant morphology in relation to habitat requirements.			
LO3 Assess how to manage the identification and classification of plants.			LO3 LO4  D2 Analyse the rationale for using a plant nomenclature system and international binomial system.
P6 Identify and apply relevant information from organisations.	M3 Explain botanical nomenclature as it relates to current and correct use of taxonomic terms.		
LO4 Analyse the legislative implications relating to managing the identification and classification of plants.			
P7 Assess the relevant legislative requirements affecting plant sourcing, propagation and distribution.	4 Critically evaluate the current systems and procedures relating to the registration of new plant varieties.		
P8 Examine the requirements and restrictions relating to plant breeder's rights.			

## Recommended resources

### Textbooks

- BRICKELL, C. (2010) *RHS Encyclopaedia of Plants and Flowers*. London: Dorling Kingsley.
- CULLEN, J. (2006) *Practical Plant Identification: Including a Key to Native and Cultivated Flowering Plants Families in North Temperate Regions: Including a Key to Flowering Plants in North Temperate Regions*. Cambridge: Cambridge University Press.
- DAWSON, P. (2006) *A Handbook for Horticultural Students*. Illinois: Peter Dawson Publishing.
- ELPEL, J.T. (2013) *Botany in a Day: The Pattern Method of Plant ID*. Pony: HOPS Press.
- HARRIS, J. and HARRIS, M. (2001) *Plant Identification Terminology: An Illustrated Glossary*. Santaquin: Spring Lake Publishers Payson.
- HARRISON, L. (2012) *RHS Latin for Gardeners: Over 3000 Plant Names Explained and Explored*. London: Mitchell Beazley Publishing.
- REMAGINO, P., MAYO, S. and WILKIN, P. (2016) *Computational Botany: Methods for Automated Species Identification*. New York: Springer Publishing.
- ROSE, F. and O'REILLEY, C. (2006) *The Wildflower Key*. London: Penguin Books.

### Websites

apps.kew.org	Kew Royal Botanical Gardens World Checklist of Selected Plant Families (2017) (General reference)
www.ipni.org	The International Plant Names Index Homepage (General reference)
www.kew.org	Kew Royal Botanical Gardens Electronic plant identification resources at Kew gardens (General reference)

www.sciencedirect.com	ScienceDirect
	Horticultural Plant Journal (Journal)
www.ishs.org	ISHS International Society for Horticultural Science
	eJHS (Journal)
www.springer.com	Springer
	Journal of Classification (Journal)

## Links

This unit links to the following related units:

*Unit 4: Plant and Soil Science*

*Unit 15: Plant Selection and Propagation*

*Unit 28: Plant Physiology and Environmental Adaptation*

## Unit 4: Plant and Soil Science

<b>Unit code</b>	<b>T/616/7968</b>
<b>Unit type</b>	<b>Core</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Soils can be described as the factory floor for agriculture and horticultural production, whilst plants can be described as the product requiring nurturing and development. To be successful in the industry it is essential to be able to appreciate the underlying scientific principles which allow efficient manipulation of the properties and characteristics to optimise production. For soils, students need to be able to assess type and characteristics to allow optimal structural and nutritional adjustments to be made. For plants, students need to appreciate the structure and processes which facilitate healthy growth and reproduction.

This unit will develop the skills and knowledge required to identify different soil types and their condition along with techniques to modify them to allow optimum production. From the plant perspective, the unit will develop the knowledge of internal and external form and function to allow plants to be managed appropriately to achieve desired objectives.

The unit will cover soil identification and assessment techniques, both in the field and in the laboratory or classroom. It will also look at methods for improving soil condition to make them more productive. This will cover physical methods ranging from the use of hand tools to large-scale machinery, the incorporation of additives to improve physical properties and chemical treatment. Plant physiology and systems will be studied, including photosynthesis, transpiration, water and nutrient uptake, transportation and storage. In addition, plant reproduction and fruit and seed dispersal will be examined and the physical adaptations of plants will be explored to verify how plants are adapted to their environment. Finally, inputs in terms of pesticides, disease treatment, nutrient and water requirements will be examined.

By the end of the unit students will be able to assess soil type and condition and be able to modify condition to improve production capacity. For plants, students will be able to understand the internal processes in order to provide optimum conditions for growth, including the provision of appropriate nutrients and pest and disease treatment.

## **Learning Outcomes**

By the end of this unit students will be able to:

- 1 Identify soil type and condition
- 2 Assess adjustments which can be made to improve soils, both physical and chemical
- 3 Describe plant form and function
- 4 Describe the inputs required to optimise plant development and growth.



## Essential content

### LO1 Identify soil type and condition

#### *Soil type:*

From inspection of a profile, describe and categorise soil type present on a given site

Apply physical assessment techniques, referring to recognised methodologies to assess soil type

Refer to published documents and on-site information e.g. soil maps and vegetation type to support assessment.

#### *Soil condition:*

Use equipment and visual appraisal to assess soil condition e.g. compaction, water-logging, crumb size, organic matter content

Discuss how previous management practices have impacted on soil condition

Consider how weather and climate can impact on soil condition with reference to cultivation methods and timing

Analyse the chemical and nutrient status of soils.

### LO2 Assess adjustments which can be made to improve soils, both physical and chemical

#### *Physical adjustments:*

Soil water management through drainage practices

Routine soil preparation and cultivation techniques appropriate to the scale and type of production

Mechanical structural improvement practices appropriate to the scale and type of production

Addition of materials to adjust structure, both organic and inorganic.

#### *Chemical adjustment:*

With reference to on-site assessment, define methods for adjusting soil pH

Analyse nutrient status and calculate adjustments required to meet the needs of crops being produced.

### LO3 **Describe plant form and function**

#### *Plant form:*

Monocotyledons

Dicotyledons

Root systems and modifications

Stems, woody and non woody

Leaf structure and adaptation

Flowers and seeds.

#### *Plant function:*

Water regulation e.g. uptake, transportation and transpiration

Photosynthesis e.g. the process, dark and light cycles, limiting factors

Nutrient transport and storage

Reproduction e.g. vegetative, seed production (angiosperms and gymnosperms), flower structure, pollination methods/processes, seed dispersal methods/processes, fruit and seed types.

### LO4 **Describe the inputs required to optimise plant development and growth.**

#### *Water:*

Quantity

Sources

Timing.

#### *Nutrients:*

Macro nutrients and trace elements.

#### *Light:*

Planting time

Sowing density

Competition.

#### *Temperature:*

Optimum levels

Adjustment techniques.

*Pest and disease control:*

Herbicides

Fungicides

Pesticides

Biological control methods.

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
LO1 Identify soil type and condition		LO1 LO2  D1 Critically evaluate the impact of different management regimes on soils.
P1 For a given profile and soil sample, describe the soil type and its characteristics.  P2 From on-site analysis and provided records, produce a report on soil condition.	M1 Discuss the impact of different management practices on two different soil types.	
LO2 Assess adjustments which can be made to improve soils, both physical and chemical.		
P3 Explain physical amelioration techniques which would be applicable, and recommend chemical adjustments to be made.	M2 Evaluate the practicality and efficiency of the recommendations.	
LO3 Describe plant form and function.		LO3 LO4  D2 Evaluate the feasibility and effectiveness of artificially influencing plant production.
P4 Produce an annotated diagram of a typical flowering plant and describe two adaptations of each feature.  P5 For two physiological processes, describe their function and importance to the plant.	M3 Discuss how external influences impact on plant form and function.	
LO4 Describe the inputs required to optimise plant development and growth.		
P6 Produce a report identifying the key inputs required by plants and the impacts these have on them.	M4 Evaluate the influence of external conditions on major plant inputs.	

## Recommended resources

### Textbooks

ASHMAN, M. and PURI, G. (2008) *Essential Soil Science: A Clear and Concise Introduction to Soil Science*. Oxford: Wiley-Blackwell.

BRADY, N.C. and WEIL, R.R. (2010) *Elements of the Nature and Properties of Soils*. 3rd edn. Harlow: Pearson.

HODSON, M.J. and BRYANT, J.A. (2011) *Functional Biology of Plants*. Chichester: Wiley.

SMITH, A.L., COUPLAND, G., DOLAN, L., HARBERD, N., JONES, J., MARTIN, C., SABLowski, R. and AMEY, A. (2009) *Plant Biology*. Abingdon: Garland Science, Taylor and Francis Group.

### Websites

[www.soils.org.uk](http://www.soils.org.uk)

British society of soil science

All about soils

(Education information)

### Links

This unit links to the following related units:

*Unit 6: Principles of Crop Production*

*Unit 22: Plant and Crop Health (Diseases, Pests and Weeds)*

## Unit 5: Managing a Successful Project (Pearson-set)

<b>Unit code</b>	<b>F/616/7830</b>
<b>Unit type</b>	<b>Core</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

### Introduction

This unit is assessed by a Pearson-set assignment. The project brief will be set by the Centre, based on a theme provided by Pearson (this will change annually). The theme and chosen project within the theme will enable students to explore and examine a relevant and current topical aspect of business in the context of the Land-based business environment.

The aim of this unit is to offer students an opportunity to demonstrate the skills required for managing and implementing a project. They will undertake independent research and investigation for carrying out and executing a business project which meets appropriate business aims and objectives.

On successful completion of this unit, students will have the confidence to engage in decision-making, problem-solving and research activities using project management skills. They will have the fundamental knowledge and skills to enable them to investigate and examine relevant business concepts within a work-related context, determine appropriate outcomes, decisions or solutions and present

**Please refer to the accompanying Pearson-set Assignment Guide and the Theme Release document for further support and guidance on the delivery of the Pearson-set unit.**

## **Learning Outcomes**

By the end of this unit a student will be able to:

1. Establish project aims, objectives and timeframes based on the chosen theme
2. Conduct small-scale research, information gathering and data collection to generate knowledge to support the project
3. Present the project and communicate appropriate recommendations based on meaningful conclusions drawn from the evidence findings and/or analysis
4. Reflect on the value gained from conducting the project and its usefulness to support sustainable organisational performance.

## Essential Content

### LO1 **Establish project aims, objectives and timeframes based on the chosen theme**

#### *Project management:*

What is project management and what does it involve?

The key stages of project management

The advantages of using project management and why it is important.

#### *Initiation of the project and project planning phase:*

Scoping a project e.g. defining objectives, scope, purpose and deliverables to be produced

Steps and documentation required in the initiation phase

Developing the project plan e.g. planning for timescales and time management, cost, quality, change, risk and issues

The work breakdown structure

Use of Bar and Gantt Charts for effective planning.

### LO2 **Conduct small-scale research, information gathering and data collection to generate knowledge to support the project**

#### *Project execution phase:*

Selecting appropriate methods of information gathering, data collection and material resourcing

The distinct phases which support a coherent and logical argument

Use of secondary research to inform a primary empirical study

Qualitative and quantitative research methods.

#### *Field work:*

Selecting a sample of the consumer market, businesses or individuals (those who meet certain characteristics relevant to the research theme) used to gather data (qualitative or quantitative)

Sampling approaches and techniques (probability and non-probability sampling).



*Ethics, reliability and validity:*

All research should be conducted ethically – how is this achieved and reported?

Research should also be reliable (similar results achieved from a similar sample) and valid (the research should measure what it aimed to measure).

*Analysing information and data:*

Using data collection tools e.g. interviews and questionnaires

Using analytical techniques e.g. trend analysis, coding or typologies.

**LO3 Present the project and communicate appropriate recommendations based on meaningful conclusions drawn from the evidence findings and/or analysis**

*Communicating outcomes:*

Consider the method (written and verbal) and the medium (e.g. report, online, presentation)

Both method and medium will be influenced by the project research and its intended audience.

*Convincing arguments:*

All findings/outcomes should be convincing and presented logically where the assumption is that the audience has little or no knowledge of the project process

Developing evaluative conclusions.

*Critical and objective analysis and evaluation:*

Secondary and primary data should be critiqued and considered with an objective mindset

Objectivity results in more robust evaluations where an analysis justifies a judgement.

**LO4 Reflect on the value gained from conducting the project and its usefulness to support sustainable organisational performance.**

*Reflection for learning and practice:*

The difference between reflecting on performance and evaluating a project – the former considers the research process, information gathering and data collection, the latter the quality of the research argument and use of evidence.

*The cycle of reflection:*

Reflection in action and reflection on action

How to use reflection to inform future behaviour, particularly directed towards sustainable performance.

*Reflective writing:*

Avoiding generalisation and focusing on personal development and the research journey in a critical and objective way.

*Generalisation:*

Many studies result in generalised findings

Research which has its basis in a specific field e.g. Human Resource Management (HRM) and in a specific context should avoid generalised conclusions

Outcomes should be specific and actionable.

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>L01</b> Establish project aims, objectives and timeframes based on the chosen theme		<b>L01 L02</b>  <b>D1</b> Critically evaluate the project management process and appropriate research methodologies applied.
<b>P1</b> Devise project aims and objectives for a chosen scenario.  <b>P2</b> Produce a project management plan that covers aspects of cost, scope, time, quality, communication, risk and resources.  <b>P3</b> Produce a work breakdown structure and a Gantt Chart to provide timeframes and stages for completion.	<b>M1</b> Produce a comprehensive project management plan, milestone schedule and project schedule for monitoring and completing the aims and objectives of the project.	
<b>L02</b> Conduct small-scale research, information gathering and data collection to generate knowledge to support the project		
<b>P4</b> Carry out small-scale research by applying qualitative and quantitative research methods appropriate for meeting project aims and objectives.	<b>M2</b> Evaluate the accuracy and reliability of different research methods applied.	
<b>L03</b> Present the project and communicate appropriate recommendations based on meaningful conclusions drawn from the evidence findings and/or analysis.		<b>L03 L04</b>  <b>D2</b> Critically evaluate and reflect on the project outcomes, the decision-making process and changes or developments of the initial project management plan to support justification of recommendations and learning during the project.
<b>P5</b> Analyse research and data using appropriate tools and techniques.  <b>P6</b> Communicate appropriate recommendations as a result of research and data analysis to draw valid and meaningful conclusions.	<b>M3</b> Evaluate the selection of appropriate tools and techniques for accuracy and authenticity to support and justify recommendations.	

Pass	Merit	Distinction
<b>L04</b> Reflect on the value gained from conducting the project and its usefulness to support sustainable organisational performance.		
<b>P7</b> Reflect on the value of undertaking the research to meet stated objectives and own learning and performance.	<b>M4</b> Evaluate the value of the project management process and use of quality research to meet stated objectives and support own learning and performance.	

## Additional Evidence Requirements

In addition to the above assessment criteria students will also be required to complete a project logbook to record ideas, changes and developments as they progress and complete the project.

## Recommended Resources

### Textbooks

COSTLEY, C., ELLIOT, G. and GIBBS, P. (2010) *Doing Work Based Research: Approaches to Enquiry for Insider-researchers*. London: SAGE.

FLICK, U. (2011) *Introducing Research Methodology: A Beginner's Guide to Doing a Research Project*. London: SAGE.

GRAY, D. (2009) *Doing Research in the Real World*. 2nd edn. London: SAGE.

SAUNDERS, M., LEWIS, P. and THORNHILL, A. (2012) *Research Methods for Business Students*. 6th edn. Harlow: Pearson.

### Websites

[www.eajournals.org](http://www.eajournals.org)

European American Journals

International Journal of Quantitative  
and Qualitative Research

(Journal)

[www.emeraldinsight.com](http://www.emeraldinsight.com)

Emerald Insight

Qualitative Research Journal

(Journal)

### Links

This unit links to the following related units:

*Unit 16: Research Project (Pearson-set)*

## Unit 6: Principles of Crop Production

<b>Unit code</b>	<b>K/616/7966</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

### Introduction

All aspects of agriculture and horticulture are underpinned, directly or indirectly, by crop production; this includes animal feedstuffs and bedding, human food, pharmaceutical and industrial products, and fuel and fibre. Understanding the principles of crop production is therefore fundamental to a successful food industry.

This unit investigates a range of crops and associated production systems, from those grown extensively to intensively grown crops produced in controlled environments, identifying crops' suitability for end markets. Students will evaluate the establishment and maintenance of different crops, including differences between the requirements of various end users.

This unit should be completed alongside the practical growing, harvesting and storing of a range of crops, which will give students a relevant context within the industry, and will provide experience and knowledge in meeting the specific quality and time requirements placed upon growers. The unit culminates with the harvesting and storage of crop products.

## **Learning Outcomes**

By the end of this unit, students will be able to:

1. Analyse crop growth requirements
2. Assess the principles of crop establishment
3. Assess the management of growing crops
4. Demonstrate the application of appropriate quality criteria to the harvesting and storage of crop products.

## Essential content

### LO1 Analyse crop growth requirements

#### *Definitions:*

Annual

Biennial

Perennial crops

Botanical features.

#### *Types of crop:*

Forage

Combinable

Roots

Field vegetables

Soft fruit

Top fruit

Specialist crops.

#### *Crop growth requirements:*

Light

Water

Nutrients

Appropriate temperature

Carbon dioxide.

#### *Factors determining crop-growing locations:*

Climate

Topography

Length of growing season

Day length

Soil type

Water use efficiency.



## LO2 **Assess the principles of crop establishment**

### *Cultivar choice:*

Target end use  
Site-specific suitability  
Evaluation of quality/yield  
Sources of information  
Trials data.

### *Soil conditions:*

Drainage  
Subsoil structure  
Soil aggregate distribution  
Soil biota  
Cultivation equipment.

### *Crop establishment systems:*

Establishment methods and associated machinery  
Seedbed conditions  
Planting depth  
Soil contact  
Seed size  
Seed dressings.

## LO3 **Assess the management of growing crops**

### *Monitoring the crop through the growing season:*

Plant counts  
Growth and development stages  
Plant health monitoring  
Intercepted solar radiation  
Water use efficiency  
Use of meteorological data.

*Manipulation of plant growth:*

Planting dates

Pruning and training

Use of growth inhibitors

Fertiliser application and timings.

*Weed, pest and disease control:*

Cultural

Chemical and biological controls

Integrated pest management

Legislation

Codes of practice.

**LO4 Demonstrate the application of appropriate quality criteria to the harvesting and storage of crop products.**

*Harvesting:*

Timing

Machinery requirement

Minimising damage and waste

Use and disposal of by-products.

*Quality criteria:*

End user specifications

Supply chain requirements.

*Storage:*

Types

Environmental controls

Monitoring requirements

Loading and unloading

Assurance/industry accreditation schemes.

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>L01</b> Analyse crop growth requirements			<b>D1</b> Evaluate the factors affecting the selection of crops in a range of contrasting locations.
<b>P1</b> Assess the suitability of different crops for contrasting locations.	<b>P2</b> Describe the botanical characteristics of a range of contrasting crops.	<b>M1</b> Explain the factors affecting the selection of crops in a range of contrasting locations.	
<b>L02</b> Assess the principles of crop establishment.			<b>D2</b> Justify the suitability of the establishment conditions for the crops and cultivars selected.
<b>P3</b> Select suitable cultivars for the production of commercial crops in a range of situations.	<b>P4</b> Assess the establishment conditions of a range of contrasting crops.	<b>M2</b> Evaluate the suitability of the establishment conditions for the crops and cultivars selected.	
<b>L03</b> Assess the management of growing crops.			<b>D3</b> Justify recommendations to crop management systems to improve the production of specific crops.
<b>P5</b> Perform appropriate crop monitoring tasks through the growing season.	<b>P6</b> Assess the effectiveness of different weed, pest and disease management systems in specific crops.	<b>M3</b> Evaluate the management systems used throughout the production of specific crops.	
<b>L04</b> Demonstrate the application of appropriate quality criteria to the harvesting and storage of crop products.			<b>D4</b> Justify the crop quality criteria included within the customer specifications.
<b>P7</b> Perform a crop harvesting operation to commercial standards.	<b>P8</b> Monitor crop products to expected commercial specifications during storage.	<b>M4</b> Assess the effectiveness of harvesting and storing crop products in meeting the stated quality criteria.	

## Recommended resources

### Textbooks

DEFRA. (2010) *Fertiliser Manual (RB209)*. 8th edn. Norwich: The Stationery Office.

### Websites

<a href="http://www.ahdb.org.uk">www.ahdb.org.uk</a>	Agriculture and Horticulture Development Board (General reference)
<a href="http://www.gov.uk">www.gov.uk</a>	UK Government Publications (General reference)
<a href="http://www.redtractor.org.uk">www.redtractor.org.uk</a>	Red Tractor Assurance Homepage (General reference)
<a href="https://assurance.redtractor.org.uk">https://assurance.redtractor.org.uk</a>	Red Tractor Assurance Standards (Standards Manual)
<a href="https://cereals.ahdb.org.uk">https://cereals.ahdb.org.uk</a>	Agriculture and Horticulture Development Board AHDB Recommended Lists 2017- 2018/2018-2019 (Online summaries)

### Links

This unit links to the following related units:

*Unit 2: Business and the Business Environment*

*Unit 4: Plant and Soil Science*

*Unit 8: Protective Crop Production*

*Unit 22: Plant and Crop Health (Diseases, Pests and Weeds)*

## Unit 7: Plant and Crop Nutrition

<b>Unit code</b>	<b>A/616/7972</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

### Introduction

The common saying 'the answer lies in the soil' may actually be close to the truth. Without a close monitoring of the nutritional needs of plants, it is not possible to maximise the yield or quality of the crop. Excess fertiliser application may also be wasteful not only in cost, but also in its adverse impact on the plant and the wider environment.

This unit will enable students to understand the importance and function of key plant nutrients, how they are formulated and the most effective ways of applying them to crops. These theoretical concepts will then be used to recommend a suitable fertiliser regime for specific crop situations.

This unit contains important foundation knowledge for anyone involved with the production of plants and underpins many other scientific and practical concepts.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Discuss the role of plant nutrients on the growth of plants
2. Describe the factors affecting the uptake of nutrients by plants
3. Compare different fertiliser options for their effectiveness and cost
4. Recommend suitable plant nutrition regimes for a range of crops.

## Essential content

### LO1 Discuss the role of plant nutrients on the growth of plants

*The role of macronutrients in plant development and growth:*

Primary nutrients (nitrogen, phosphorus, potassium)

Secondary nutrients (calcium, magnesium, sulphur).

*The role of micronutrients in plant development and growth:*

Boron

Copper

Chlorine

Manganese

Molybdenum

Zinc

Iron

Nickel

Symptoms in plants of deficiency and over-supply of nutrients.

### LO2 Describe the factors affecting the uptake of nutrients by plants

*Abiotic factors:*

Rainfall/water availability

Soil and air temperature

pH of growing medium

Nutrient availability

Cation exchange

*Biotic factors:*

Stage of plant development

Root health

Impact of other organisms on uptake and availability of nutrients (bacteria, fungi)

Current nutrient status of plant

*Forms of nutrients available for uptake by plants:*

Influence of associated ions (impact of calcium)

Common available forms of primary macronutrients (nitrogen, phosphorus, potassium)

*Impact of limiting factors:*

Economic and maximum yield

Adaptation of growing conditions

Loss of nutrients (from growing medium, plants).

### **LO3 Compare different fertiliser options for their effectiveness and cost**

*Fertiliser formulations:*

Organic, inorganic

Speed of action (fast acting, controlled released, slow release)

Composition (compound fertiliser, straight fertiliser)

Formulation (granule, powder, liquid)

Site of nutrient delivery (roots, foliage)

Non-nutritional carriers/fillers within fertilisers (humus, peat, sand, sawdust, polymer coatings, etc.).

*Costs of application:*

Procurement cost

Storage cost

Application costs (machinery and labour)

Longevity of application.

*Effectiveness of formulation:*

Rate of nutrient availability to plants post-application

Fertiliser analysis

Environmental impacts (impacts on biotic activity, leaching, eutrophication, salinisation).



#### LO4 **Recommend suitable plant nutrition regimes for a range of crops.**

##### *Methods to determine nutrient availability:*

Remote nutrient analysis (from soil or growing medium, plant material/tissue analysis)

Direct measure (open and closed hydroponic-based systems).

##### *Nutrient requirements of crops:*

Duration of crop (growing season)

Mode of production (open ground, protected cropping, hydroponics)

Type of product harvested (root, shoot, leaf, flower, seed, fruit, whole plant).

##### *Fertiliser application plans:*

Specification of product

Application rate

Timing

Environmental and legal constraints.

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>L01</b> Discuss the role of plant nutrients on the growth of plants.			<b>L01 L02</b>  <b>D1</b> Critically analyse the importance of providing suitable levels of nutrients for growing crops.
<b>P1</b> Explain the role of macronutrients in the health and development of plants.  <b>P2</b> Explain the role of micronutrients in the health and development of plants.	<b>M1</b> Evaluate the impact of balanced nutrient availability on the development of plants.		
<b>L02</b> Describe the factors affecting the uptake of nutrients by plants			
<b>P3</b> Explain the biotic and abiotic factors impacting upon the uptake of nutrients by plants.	<b>M2</b> Analyse the impact of nutrient availability on yield.		
<b>L03</b> Compare different fertiliser options for their effectiveness and cost.			<b>D2</b> Critically analyse the environmental impact of selected fertiliser formulations.
<b>P4</b> Describe the impact of fertiliser formulation upon the availability of plant nutrients.  <b>P5</b> Describe the costs associated with the procurement, storage and application of different fertiliser formulations.  <b>P6</b> Compare the effectiveness of different fertiliser formulations.	<b>M3</b> Evaluate a range of fertiliser formulations for their effectiveness to meet specific criteria.		
<b>L04</b> Recommend suitable plant nutrition regimes for a range of crops.			
<b>P7</b> Identify the nutritional needs for selected crops.  <b>P8</b> Develop fertiliser plans for selected crops.	<b>M4</b> Analyse the effectiveness of plant nutrition recommendations.		<b>D3</b> Evaluate a range of fertiliser plans to meet specific customer needs.

## Recommended resources

### Textbooks

EASH, N.S., SAUER, T.J., O'DELL, D., ODOI, E. and BRATZ, M.C. (2015) *Soil Science Simplified*. 6th edn. New Jersey: Wiley-Blackwell.

HUSSEIN, M. and NESSIM, H. (2014) *Fertilizer Understanding: Concepts, Specifications, Adulteration and Analysis*. Saarbrücken: Lambert Academic Publishing.

NAEEM, M., ANSARI, A.A. and GILL, S.S. (2017) *Essential Plant Nutrients: Uptake, Use Efficiency, and Management*. Great Britain: Springer.

Barker, A.V. and PILBEAM, D.J., (2015) *Handbook of Plant Nutrition*. 2nd edn. Boca Raton: CRC Press.

### Websites

extensionpublications.unl.edu	Extension dept. of University of Nebraska
	Plant Nutrients and Soil Fertility (E-Book)

### Links

This unit links to the following related units:

*Unit 4: Plant and Soil Science*

*Unit 6: Principles of Crop Production*

## Unit 8: Protective Crop Production

<b>Unit code</b>	<b>F/616/7973</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

### Introduction

The consumer demand for agricultural and horticultural products means that there is an expectation for all-year-round availability meeting tight quality standards. However, the seasonality of the outdoor growing environment does not always allow this demand to be met. While growing crops in other countries can help to meet demand, the environmental cost of this type of production (the 'air miles') is under scrutiny.

Protected cropping provides a potential solution to meet the demands for growing a crop more locally and extending the season. The challenge for the modern grower is to do this in a way that uses resources efficiently.

This unit investigates a range of production systems, from those with little investment through to complex computer-controlled environments, identifying their suitability for different types of crops. Students will evaluate production systems for different crops, including how the growing blueprint may vary between different cultivars. The unit covers both the production of flowers, for cutting or in pots, and the production of a wide range of foods.

This unit will be most effective when it is completed alongside the growing of a range of protected crops as this provides a relevant connection with the industry sector and will provide experience and knowledge in meeting the specific quality and time requirements placed upon growers. The unit culminates with the harvesting of the crops produced – the final stage in the growing process for these crops.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Analyse growing regimes for protected crops
2. Develop a commercial plan for the growing of crops
3. Assess the management systems used in the growing of protected crops
4. Demonstrate the application of appropriate quality criteria to the harvesting of protected crops.

## Essential content

### LO1 Analyse growing regimes for protected crops

#### *Types of structure:*

Polythene tunnels

Glass structures

Polycarbonate structures

Cloches

Cold frames

Netting tunnels

Mushroom-growing structures

Non-rigid structures (floating cloches).

#### *Types of crop:*

Cut flowers

Houseplants

Herbs

Vegetables

Fruit

Young plant production

Mushrooms.

#### *Pest & disease control:*

Cultural

Chemical

Biological controls

Integrated pest management

Legislation.

*Development of growing blueprints:*

Climate management e.g. light, heat, moisture, day length, humidity, nutrients

Availability of local resources:

Labour

Access to markets

Essential services.

## **LO2 Develop a commercial plan for the growing of crops**

*Planning considerations:*

Time of year

Labour availability

Customer requirements

Climatic conditions.

*Growing blueprints:*

Computer-controlled environments

Environmental monitoring.

*Varietal choice:*

Predicted performance in growing conditions

Evaluation of quality/yield

Sources of varietal/cultivar information.

## **LO3 Assess the management systems used in the growing of protected crops**

*Environmental control:*

Equipment used

Predictive technology

Use of historical data

Relationships between heat/light/carbon dioxide/humidity.

*Crop scheduling:*

Market needs

Successional crops.

*Manipulation of plant growth:*

Pest and disease control

Pruning and training

Use of growth inhibitors/modifiers

Use of environmental conditions in protected environment.

**LO4 Demonstrate the application of appropriate quality criteria to the harvesting of protected crops.**

*Quality criteria:*

Customer specification/market requirements

Size

Colour

Developmental stage

Labelling

Legal obligations

Presentation requirements

Cool chain requirements

*Productivity expectations:*

Commercial speed expectations

Benchmarking of performance

Waste.

*Markets:*

Retail

Multiples

Contract

Wholesale

International and domestic legislation

Quality Assurance/industry accreditation schemes



## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>L01</b> Analyse growing regimes for protected crops		<b>D1</b> Evaluate the suitability of a selected structure for the growing of a commercial crop.
<b>P1</b> Assess the suitability of different protected structures to meet the needs of stated crops.  <b>P2</b> Describe the application of crop protection methods within protected structures.	<b>M1</b> Explain the factors affecting the selection of structures to meet the needs of specific crops.	
<b>L02</b> Develop a commercial plan for the growing of crops		<b>D2</b> Justify recommendations made to improve the effectiveness of a current commercial growing plan.
<b>P3</b> Develop and present plans for the production of commercial crops.  <b>P4</b> Assess how commercial growing plans are adapted to optimise the growth of different cultivars of a plant species.	<b>M2</b> Evaluate the effectiveness of a growing plan to meet specific customer requirements.	
<b>L03</b> Assess the management systems used in the growing of protected crops.		<b>D3</b> Justify recommendations to improve a commercial production system.
<b>P5</b> Analyse the management systems used in diverse protected cropping systems.  <b>P6</b> Evaluate the effectiveness of different pest and disease management systems in specific crops.	<b>M3</b> Critically review the management systems used within a commercial production system.	

Pass	Merit	Distinction
<b>L04</b> Demonstrate the application of appropriate quality criteria to the harvesting of protected crops.		<b>D4</b> Explain and justify the quality criteria included within customer specifications.
<b>P7</b> Perform the harvesting of crops to expected commercial specifications.  <b>P8</b> Present harvested crops according to specification.	<b>M4</b> Assess the effectiveness of the harvested crop in meeting the stated quality criteria.	

## Recommended resources

### Textbooks

BARRETT, T. (2016) *Polytunnels, Greenhouses and Protective Cropping: A Guide to Growing Techniques*. Marlborough: Crowood Press.

BEYTES, C. (2012) *Ball Redbook: Greenhouses and Equipment v1*. 18th edn. Chicago: Ball Publishing.

CASTILLA, N. and BAEZA, E.J. (2012) *Greenhouse Technology and Management*. 2nd edn. Wallingford: CABI.

MEFFERD, A. (2017) *The Greenhouse and Hoophouse Grower's Handbook: Organic Vegetable Production Using Protected Culture*. Vermont: Chelsea Green Publishing.

NAU, J. (2012) *Ball Redbook: Crop Production v2*. 18th edn. Chicago: Ball Publishing.

### Websites

<a href="http://www.greenhousegrower.co.uk">www.greenhousegrower.co.uk</a>	Commercial Greenhouse Grower Specialist grower publication (Research resource)
<a href="http://www.greenhousemag.com">www.greenhousemag.com</a>	Greenhouse Management Magazine The foremost specialist UK publication for commercial greenhouse growing (News articles)

### Links

This unit links to the following related units:

*Unit 2: Business and the Business Environment*

*Unit 4: Plant and Soil Science*

*Unit 6: Principles of Crop Production*

*Unit 22: Plant and Crop Health (Diseases, Pests and Weeds)*

## Unit 9: Land-based Machinery and Technology

<b>Unit code</b>	<b>A/616/7969</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Large-scale agricultural and horticultural enterprises make extensive use of machinery. These machines are invariably expensive and complex. The correct selection and use of these is an important factor in the viability of a business and to ensure timely operations. The Land-based labour force has reduced dramatically and alongside this there has been an equally dramatic increase in the average power of the tractors in use. These complex machines require skilled operators and knowledge of their maintenance requirements. Legislation not only covers on-the-road requirements and operator competence but also the increased complexity of pollution control.

This unit will develop students' knowledge and skills in selecting and understanding the operation of tractors and equipment, both individually and in combinations. This will include understanding how machines work, engine and fuel types and overall maintenance. Students will undertake some practical review and operation of tractors and machinery to facilitate an understanding of these from an operator perspective.

On completion of this unit students will have an intimate knowledge of the basic characteristics of a range of power units, tractors and machines, enabling them to make informed choices and decisions in machine selection and operation. The unit is intended to be flexible in content to take account of the diversity of agriculture in the UK and overseas and to provide a basis for further more specialist study of mechanisation and perhaps international crop production courses.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Identify the machinery requirements of an enterprise
2. Explain the operation and characteristics of engine powered Land-based vehicles
3. Demonstrate an understanding of the operation and maintenance of machines
4. Examine issues relating to machinery use in Land-based operations.

## Essential content

### LO1 Identify the machinery requirements of an enterprise

*Machines available to the industry:*

Tractor units

Multi-purpose machines

Special-purpose machines

Tractor mounted and trailed equipment and self-propelled machines

Two-wheel and four-wheel drive, all-wheel drive, articulated and self-steering

Purpose of machines e.g. haulage, transport, powering other equipment, application of materials

*Understanding the complexity of the enterprise:*

Scale

Machinery systems

Seasonality

Soil types

Machine adaptations for adverse and unusual circumstances

### LO2 Explain the operation and characteristics of engine powered Land-based vehicles

*Power sources:*

Engines e.g. two and four-stroke cycles and electric motors

Cooling

Air supply

Lubrication

Steering

Braking

Electrical systems

Petrol

Diesel

Bio-fuels

LPG fuels

*Transmission of power:*

Through-drive chains

Use of gears

Gearboxes and hydraulics

Clutch types and safety clutches

Operation of ancillary and attached equipment and hitches

**LO3 Demonstrate an understanding of the operation and maintenance of machines**

*Principles of industry standard operation and operator maintenance:*

Awareness of standards required and work methods

Operator competence and operator training

Management support processes and understanding of machine layout and working systems

*Operation:*

Pre-use setting up of machine and machine combination

Understand operational requirements and operator competence

Machine controls and safety features, safe operation

Use of clutch, gears, brakes, steering and auxiliary controls

*Maintenance:*

Use of operator manuals

Pre-start and daily checks, routine maintenance, repairs and servicing

Facilities and tools required

Pre-season preparation

#### **LO4 Examine issues relating to machinery use in Land-based operations.**

##### *Operational:*

In-field support

Fuelling

Supply

Access

Transport

Manoeuvrability

##### *Storage requirements:*

Covered/uncovered

Security

Siting of storage and support facilities

Legislative factors

Fuel storage requirements and legislation

##### *Maintenance and repair:*

Operator skills

What to do on-site or use of dealer/engineer

Staffing

Record-keeping and maintenance scheduling

Facilities for maintenance e.g. workshop, tools and equipment, spares to be held

##### *Legislation:*

Law relating to moving machinery on the road

Age limits for machine use

Operator certificates of competence

Health and Safety legislation e.g. self-protection and protection of others

Personal protective equipment (PPE)

Safe systems of work

Legislation relating to machine design

Noise regulations, guards and CE markings

Waste disposal requirements and legislation

First aid facilities



## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>LO1</b> Identify the machinery requirements of an enterprise.		<b>LO1 LO2</b> <b>D1</b> Critically analyse the suitability of the machinery identified.
<b>P1</b> Explain the requirements for an identified enterprise. <b>P2</b> Describe machinery suitable for the identified enterprise.	<b>M1</b> Justify machinery selection.	
<b>LO2</b> Explain the operation and characteristics of engine powered Land-based vehicles.		
<b>P3</b> Compare power units available for machinery. <b>P4</b> Explain how the power of an engine may be harnessed and applied.	<b>M2</b> Evaluate a machinery combination for an identified operation.	
<b>LO3</b> Demonstrate an understanding of the operation and maintenance of machines.		<b>LO3 LO4</b> <b>D2</b> Evaluate the use and support of machinery in an enterprise.
<b>P5</b> Demonstrate an understanding of the operation of a tractor. <b>P6</b> Demonstrate an understanding of the maintenance of a tractor.	<b>M3</b> Assess the operation and maintenance of a tractor in use.	
<b>LO4</b> Examine issues relating to machinery use in Land-based operations.		
<b>P7</b> Describe the legislation relevant to the use of machinery. <b>P8</b> Explain the requirements to support the operation of machinery.	<b>M4</b> Examine how Health and Safety factors interact with the operation and support of machinery.	

## Recommended resources

### Textbooks

- BALLS, R. (1985) *Horticultural Engineering Technology – Field Machinery*. Basingstoke: MacMillan.
- BELL, B. (2016) *Farm Machinery*. 6th edn. Sheffield: Farming Press.
- CULPIN, C. (2014) *Farm Machinery*. 12th edn. Oxford: Wiley.
- HILLIER, V.A.W. and PITTUCK, F. (2012) *Fundamentals of Motor Vehicle Technology*. 3rd edn. Cheltenham: Nelson Thornes.
- HSC. (2017) *Farm Wise – Your Essential Guide to Health and Safety in Agriculture*. 3rd edn. London: Stationary Office.
- HSE. (2012) *Working Safely with Agricultural Machinery*. London: Stationary Office.
- WITNEY, B. (1998) *Choosing and Using Farm Machines*. Harlow: Longman Scientific and Technical.

### Websites

- |  |  |
|--|--|
| <a href="http://www.fwi.co.uk">www.fwi.co.uk</a> | Farmers Weekly<br>Arable/precision farming<br>(General reference)          |
| <a href="http://www.iagre.org">www.iagre.org</a> | Institute of Agricultural Engineers<br>Publications<br>(General reference) |

### Links

This unit links to the following related units:

*Unit 6: Principles of Crop Production*

*Unit 25: Tree Care and Arboricultural Management*

*Unit 26: Woodland Management*

## Unit 10: Rural Business Administration and Accounting

<b>Unit code</b>	<b>T/616/7971</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

### Introduction

The centre hub for most businesses is the office, which is often the first 'port of call' for visitors, goods and correspondence. This is where direction and control initially takes place. This unit links with all business type activities (accounting, finance, HR, marketing and management) and is an integral part of all the elements of running a business. Processing information and presenting it in a format that is easily understood will aid management and the effective planning of the business. The importance of business administration and the people who conduct this operation can therefore not be underestimated.

For effective management and planning it is important that paperwork is managed effectively, placing all correspondence from whatever source e.g. electronic, postal, etc. into the correct order and retrieval systems. An effective paper-handling system should lead to improved efficiency in processing and thus negate costly delays.

The overall aim of this unit will be to enable students to create, maintain and complete financial records as required by an accountant in order for them to produce the year-end accounts and information for the calculation of payroll. Students will cover areas such as business transactions, flow of information processes, bookkeeping systems, bank reconciliations, calculating Value Added Tax (VAT) and the calculation of gross pay.

On successful completion of this unit students will be able to set up a financial accounting system which will comply with the statutory rules and regulations for accounting record-keeping for a rural business, and have the fundamental knowledge to use these records for a higher level of study.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Describe the paperwork that is required for the effective recording of business transactions
2. Perform an accounting system suitable for a Land-based business so to enable the completion of year-end accounts
3. Prepare information required for VAT reporting to HMRC
4. Explain the operation of basic PAYE within a Land-based business and calculate gross pay.

## Essential content

### LO1 Describe the paperwork that is required for the effective recording of business transactions

#### *Business transactions:*

Identification of appropriate paperwork

Assess the different types of transactions (sales, purchase, receipts and payments)

Self-bill invoices

Private apportionment of costs

Contra invoices

#### *Information processes:*

Processes that are used to maintain a flow of information from the business to the office (quote, order, delivery note, invoice, statement, etc.)

### LO2 Perform an accounting system suitable for a Land-based business so to enable the completion of year-end accounts

#### *Single entry/double entry bookkeeping:*

Assess the differences between the two methods of bookkeeping

Sales and purchases

Categorisation of business inputs and expenditure for management accounting purposes (standard and business specific)

Petty cash systems

Effectively record transactions

#### *Bank reconciliation:*

Bank statement

Cashbook entries (receipts and payments)

Unpresented cheques and receipts

Calculation of bank reconciliation

### LO3 **Prepare information required for VAT reporting to HMRC**

*VAT calculation and reporting:*

Calculation of VAT

Reporting time restriction to the HMRC

*Reporting process*

*Various methods of accounting VAT:*

Standard rate

Flat rate

Annual accounting scheme

Cash accounting scheme

*Registration thresholds and types:*

Standard rate

Flat rate

Annual accounting scheme

Cash accounting scheme

### LO4 **Explain the operation of basic PAYE within a Land-based business and calculate gross pay**

*Definition of PAYE:*

HMRC

Employer

Employee

*Calculation of gross pay:*

Time sheets

Validation of the work done

Pay rates

Holiday entitlement

Other statutory entitlements (sick pay, maternity pay, paternity pay, pension) etc

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>L01</b> Describe the paperwork that is required for the effective recording of business transactions.		<b>L01 L02</b> <b>D1</b> Critically evaluate how differing accounts systems are suitable for different businesses.
<b>P1</b> Describe a method of effectively and efficiently collecting the financial information of a given business for input into an identified accounting system.	<b>M1</b> Discuss the term 'contra' within the context of financial accounting and provide Two examples of how this could happen.	
<b>P2</b> Explain the differing transaction types and how they are entered into an accounting system.		
<b>L02</b> Perform an accounting system suitable for a Land-based business so to enable the completion of year-end accounts		
<b>P3</b> Demonstrate preparing and recording entries onto a single entry accounts system for an identified Land-based business for a three month period.	<b>M2</b> Discuss how the information from the accounts system is used and to what purpose.	<b>D2</b> Analyse the VAT registration types and discuss their benefits to Land-based businesses.
<b>P4</b> Describe the term 'bank reconciliation' and how it is calculated.		
<b>L03</b> Prepare information required for VAT reporting to HMRC.		
<b>P5</b> Prepare a VAT Return for an identified Land-based business.	<b>M3</b> Evaluate the different methods of VAT accounting for Land-based businesses.	
<b>P6</b> Explain the reporting process to the HMRC, including any time restrictions.		

Pass	Merit	Distinction
<b>LO4</b> Explain the operation of basic PAYE within a Land-based business and calculate gross pay.		<b>D3</b> Investigate the statutory requirements of PAYE.
<b>P7</b> Describe gross pay and calculate it from two given time sheets.  <b>P8</b> Describe the calculation of holiday entitlement.	<b>M4</b> Discuss the process of collecting accurate information to assist wage calculation.	



## Recommended resources

### Textbooks

IAgSA. (2016) *The Farm Office Handbook*. Ipswich: Old Pond Publishing Ltd.

### Websites

www.gov.uk	UK Government Employing-people (General reference)
www.gov.uk	UK Government Business-tax (General reference)

### Links

This unit links to the following related units:

*Unit 13: Management Accounting*

*Unit 34: Advanced Financial Accounting*

# Unit 11: Human Resource Management

<b>Unit code</b>	<b>A/616/7843</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

## Introduction

The aim of this unit is to enable students to appreciate and apply principles of effective Human Resource Management (HRM). People are the lifeblood of any Land-based organisation and being able to attract, recruit and retain talented staff and volunteers is at the core of all HRM activity.

This unit will explore the tools and techniques used in HRM to maximise the employee/volunteer contribution and how to use HR methods to gain competitive advantage. Students will explore the importance of training and development in building and extending the skills base of the organisation and ensuring it is relevant to the ever-changing business environment. Students will also consider the growing importance of becoming a flexible organisation within the Land-based sector, with an equally flexible labour force, and become familiar with techniques of job design and different reward systems.

The unit investigates the importance of good employee/volunteer relations and the ways in which employers engage with their staff and possibly with trade unions. Students will gain an understanding of the law governing HRM processes as well as the best practices which enable an employer to become an 'employer of choice' in their labour market.

## **Learning Outcomes**

By the end of this unit a student will be able to:

1. Explain the purpose and scope of Human Resource Management in terms of resourcing a Land-based organisation with talent and skills appropriate to fulfil business objectives
2. Evaluate the effectiveness of the key elements of Human Resource Management in a Land-based organisation
3. Analyse internal and external factors that affect Human Resource Management decision-making, including employment legislation
4. Apply Human Resource Management practices in a work-related context.

## Essential Content

### LO1 **Explain the purpose and scope of Human Resource Management in terms of resourcing a Land-based organisation with talent and skills appropriate to fulfil business objectives**

*The nature and scope of HRM:*

Definitions of HRM

What are the main functions and activities of HRM?

The 'Best Fit' approach versus 'Best Practice'

The hard and soft models of HRM

Workforce planning

Types of labour market, labour market trends and PESTLE

The internal labour market

Analysing turnover, stability and retention

The impact of legal and regulatory frameworks

The impact that advances in technology have had on improving the efficiency of HR practices

*Recruitment (employees and volunteers):*

Sources of recruitment e.g. internal versus external recruitment

Job analysis, job descriptions, personal specifications and competency frameworks

*Selection (employees and volunteers):*

Main methods of selection and strengths and weaknesses of each

Reliability and validity as key criteria

*On-boarding and induction (employees and volunteers):*

The issues affecting successful induction and socialisation of employees

## **LO2 Evaluate the effectiveness of the key elements of Human Resource Management in a Land-based organisation**

### *Learning, development and training:*

Differentiating development and training  
Identifying training needs – the training gap  
Types of training  
Evaluation of training

### *Job and workplace design:*

Reward management e.g. extrinsic and intrinsic rewards from work  
The link between motivational theory and reward  
Series of job design-job extension techniques.

### *The flexible organisation:*

Types of flexibility e.g. numerical, structural and functional flexibility  
Models of flexible organisations e.g. Handy, Atkinson  
Flexible working options in modern organisations  
Benefits to employers and benefits to employees/volunteers of flexible working practices.

### *Performance and reward:*

Performance management and methods used to monitor employee/volunteer performance  
Types of payment and reward system  
Methods of a determination.

## **LO3 Analyse internal and external factors that affect Human Resource Management decision-making, including employment legislation**

### *Employee/volunteer relations:*

Maintaining good employee/volunteer relations  
Strategies for building and improving employee/volunteer relations and engagement.

*Employee/volunteer relations and the law:*

The purpose of employment law

Key legal issues and constraints e.g. equality, data protection, Health and Safety, redundancy, dismissal, employment contracts

Ethical and social responsibilities

*Trade unions and workplace representation:*

The role of trade unions – local/national

Collective agreements

Discipline, grievances and redundancy – best practice

**LO4 Apply Human Resource Management practices in a work-related context.**

*Job and person specifications:*

Preparing job specifications and person specifications applicable to the recruitment context and needs of the organisation, taking into account legislation and company policies.

*Recruitment and selection in practice:*

The impact of technology on improving the recruitment and selection process e.g. the use of online resources, digital platforms and social networking

Designing and placing job advertisements

Shortlisting and processing applications

Interviewing preparation and best practice

Selection best practice

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>L01</b> Explain the purpose and scope of Human Resource Management in terms of resourcing a Land-based organisation with talent and skills appropriate to fulfil business objectives			<b>D1</b> Critically evaluate the strengths and weaknesses of different approaches to recruitment and selection, supported by specific examples.
<b>P1</b> Explain the purpose and the functions of HRM, applicable to workforce planning and resourcing an organisation.	<b>P2</b> Explain the strengths and weaknesses of different approaches to recruitment and selection.	<b>M1</b> Assess how the functions of HRM can provide talent and skills appropriate to fulfil business objectives.  <b>M2</b> Evaluate the strengths and weaknesses of different approaches to recruitment and selection.	
<b>L02</b> Evaluate the effectiveness of the key elements of Human Resource Management in a Land-based organisation			<b>D2</b> Critically evaluate HRM practices and application within an organisational context, using a range of specific examples.
<b>P3</b> Explain the benefits of different HRM practices within an organisation for both the employer and employee/volunteer.	<b>P4</b> Evaluate the effectiveness of different HRM practices in terms of raising organisational profit and productivity.	<b>M3</b> Explore the different methods used in HRM practices, providing specific examples to support evaluation within an organisational context.	

Pass	Merit	Distinction
<b>L03</b> Analyse internal and external factors that affect Human Resource Management decision-making, including employment legislation		<b>L03 L04</b> <b>D3</b> Critically evaluate employee relations and the application of HRM practices that inform and influence decision-making in an organisational context.
<b>P5</b> Analyse the importance of employee/volunteer relations in respect to influencing HRM decision-making. <b>P6</b> Identify the key elements of employment legislation and the impact it has upon HRM decision-making.	<b>M4</b> Evaluate the key aspects of employee/volunteer relations management and employment legislation that affect HRM decision-making in an organisational context.	
<b>L04</b> Apply Human Resource Management practices in a work-related context.		
<b>P7</b> Illustrate the application of HRM practices in a work-related context, using specific examples.	<b>M5</b> Provide a rationale for the application of specific HRM practices in a work-related context.	



## Recommended Resources

### Textbooks

ARMSTRONG, M. and TAYLOR, S. (2014) *Armstrong's Handbook of Human Resource Management Practice*. 13th edn. London: Kogan Page.

BACH, S. and EDWARDS, M. (2013) *Managing Human Resources*. Oxford: Wiley.

BRATTON, J. and GOLD, J. (2012) *Human Resource Management: Theory and Practice*. 5th edn. Basingstoke: Palgrave.

TORRINGTON, D. et al. (2011) *Human Resource Management*. 8th edn. London: Prentice Hall.

### Websites

[www.cipd.co.uk](http://www.cipd.co.uk)

Chartered Institute of Personnel  
and Development  
Homepage  
(General reference)

### Links

This unit links to the following related units:

*Unit 2: Business and the Business Environment*

## Unit 12: Marketing Essentials

<b>Unit code</b>	<b>F/616/7844</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

### Introduction

This unit is designed to introduce students to the principles of marketing, enabling them to develop a basic marketing plan and to employ elements of the marketing mix to achieve results. While students will learn the underpinning theories and frameworks, they will also be able to relate these to real-world examples, including products/services that they encounter in their own daily lives.

Organisations that work within the Land-based sector or are associated with it such as Cadbury, Nestle, Unilever, Muller, John Deer, ABP, NFU and small local businesses all have at least one thing in common: they all use marketing to influence us to engage with their products and/or services. Whether it is becoming a loyal customer buying a product and service or donating to a charity, organisations use a range of marketing techniques and tools to inform and influence us.

The knowledge, understanding and skill sets that students will gain on successfully completing this unit will enhance their career opportunities, whether setting up their own business or being employed by a Land-based organisation.

## **Learning Outcomes**

By the end of this unit a student will be able to:

1. Explain the role of marketing and how it interrelates with other functional units of a Land-based organisation
2. Compare ways in which organisations use elements of the marketing mix (7Ps) to achieve overall business objectives
3. Develop and evaluate a basic marketing plan.

## Essential Content

### LO1 **Explain the role of marketing and how it interrelates with other functional units of a Land-based organisation**

#### *Definitions and the marketing concept:*

Definitions of marketing and the nature of marketing

The development of the marketing concept e.g. current and future trends

How the external environment influences and impacts upon marketing activity

#### *The role of marketing:*

The structure and operations of marketing departments

Overview of marketing processes e.g. analysis, strategic planning and the marketing mix

The different roles of marketing within both a B2C and B2B context

#### *The interrelationships of functional units:*

Marketing as a business function

The different roles of business units and the interrelationships between these functional units and marketing

### LO2 **Compare ways in which organisations use elements of the marketing mix (7Ps) to achieve overall business objectives**

#### *The 7Ps marketing mix:*

Product – differences between products and services, importance of brands, product development and product lifestyle

Price – pricing context, pricing strategies and tactics

Place – channel management, supply chain management and logistics

Promotion – integrated communication mix and promotional tools

People – the different roles of ‘people’ in marketing e.g. customer interfacing and support personnel, and the different skills, attitudes and behaviour of people delivering the product or service to customers

Physical evidence – the tangible aspects of service delivery e.g. visual, aural and olfactory elements

Process – systems and processes involved in delivering a consistent service and different types of processes used to expedite the marketing function

*Achieving overall business objectives:*

The shift from the 4Ps to the 7Ps and the significance of the extended marketing mix

An overview of the marketing planning process (analysis, planning, implementation and control) and marketing strategy

### **LO3 Develop and evaluate a basic marketing plan.**

*Marketing planning:*

The importance and value of marketing plans

The links between marketing plans, marketing objectives and marketing strategies

Evaluating and monitoring marketing plans using appropriate control and evaluation techniques e.g. sales analysis, market-share analysis, efficiency ratios and cost-profitability analysis

*Structure and development of marketing plans:*

Market segmentation and target market selection

Setting goals and objectives

Situational analysis tools and techniques

Creating a marketing strategy

Allocation of resources

Monitoring and control measures

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>L01</b> Explain the role of marketing and how it interrelates with other functional units of a Land-based organisation.			<b>D1</b> Critically analyse and evaluate the key elements of the marketing function and how they interrelate with other functional units of an organisation.
<b>P1</b> Explain the key roles and responsibilities of the marketing function. <b>P2</b> Explain how roles and responsibilities of marketing relate to the wider organisational context.	<b>M1</b> Analyse the roles and responsibilities of marketing in the context of the marketing environment. <b>M2</b> Analyse the significance of interrelationships between marketing and other functional units of an organisation.		
<b>L02</b> Compare ways in which organisations use elements of the marketing mix (7Ps) to achieve overall business objectives.			<b>L02 L03</b> <b>D2</b> Design a strategic marketing plan that tactically applies the use of the 7Ps to achieve overall marketing objectives.
<b>P3</b> Compare the ways in which different organisations apply the marketing mix to the marketing planning process to achieve business objectives.	<b>M3</b> Evaluate different tactics applied by organisations to demonstrate how business objectives can be achieved.		
<b>L03</b> Develop and evaluate a basic marketing plan.			
<b>P4</b> Produce and evaluate a basic marketing plan for an organisation.	<b>M4</b> Produce a detailed, coherent, evidence-based marketing plan for an organisation.		

## Recommended Resources

### Textbooks

BRASSINGTON, F. and PETTITT, S. (2012) *Essentials of Marketing*. 3rd edn. Harlow: Pearson.

GROUCUTT, J. and HOPKINS, C. (2015) *Marketing (Business Briefings)*. London: Palgrave Macmillan.

JOBBER, D. and CHADWICK, F. (2012) *Principles and Practice of Marketing*. 7th edn. Maidenhead: McGraw-Hill.

KOTLER, P. and ARMSTRONG, G. (2013) *Principles of Marketing*. London: Prentice Hall.

MCDONALD, M. and WILSON, H. (2011) *Marketing Plans: How to Prepare Them, How to Use Them*. 7th edn. Chichester: John Riley and Sons.

### Websites

[www.ama.org](http://www.ama.org)

American Marketing Association

Homepage

(General reference)

[www.cim.co.uk](http://www.cim.co.uk)

Chartered Institute of Marketing  
(UK)

Homepage

(General reference)

### Links

This unit links to the following related units:

*Unit 2: Business and the Business Environment*

## Unit 13: Management Accounting

<b>Unit code</b>	<b>H/508/0489</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

### Introduction

The overall aim of this unit is to introduce the fundamentals of management accounting which apply to the wider Land-based business environment and the organisations which operate within that environment. Students will explore how management accounting uses financial data to aid planning decisions, and the monitoring and control of finance within organisations.

On successful completion of this unit students will be in a position to present financial statements in a workplace context and be able to assist senior colleagues with financial business planning. In addition, students will have the fundamental knowledge and skills to progress onto a higher level of study.



## **Learning Outcomes**

By the end of this unit a student will be able to:

1. Demonstrate an understanding of management accounting systems
2. Apply a range of management accounting techniques
3. Explain the use of planning tools used in management accounting
4. Compare ways in which organisations could use management accounting to respond to financial problems.

## Essential Content

### LO1 **Demonstrate an understanding of management accounting systems**

#### *Introduction to management accounting:*

What is management accounting? Definition of management accounting

What is a management accounting system?

Why is it important to integrate these within an organisation?

Explore the origin, role and principles of management accounting

The distinction between management and financial accounting

#### *Different types of management accounting systems:*

Cost-accounting systems

Inventory management systems

Job-costing systems

Price-optimising systems

Benefits of different types of systems

#### *Presenting financial information:*

Why information should be relevant to the user, reliable, up-to-date and accurate

Why the way in which the information is presented must be understandable

Different types of managerial accounting reports

### LO2 **Apply a range of management accounting techniques**

#### *Microeconomic techniques:*

What is meant by cost? Different costs and cost analysis

Cost-volume profit, flexible budgeting and cost variances

Applying absorption and marginal costing

#### *Product costings:*

Fixed and variable costs, cost allocation

Normal and standard costing, activity-based costing and the role of costing in setting price

*Cost of inventory:*

Definition and meaning of inventory costs and different types of inventory costs

The benefits of reducing inventory costs to an organisation

Valuation methods

Cost variances

Overhead costs

**LO3 Explain the use of planning tools used in management accounting**

*Using budgets for planning and control:*

Preparing a budget

Different types of budgets (e.g. capital and operating)

Alternative methods of budgeting

Behavioural implications of budgets

*Pricing:*

Pricing strategies

How do competitors determine their prices?

Supply and demand considerations

*Common costing systems:*

Actual costing, normal costing and standard costing systems

How cost systems differ depending on the costing activity e.g. job costing, process costing, batch costing and contract costing

*Strategic planning:*

Applying PEST, SWOT, balance scorecard or Porter's Five Forces analysis to the financial position of an organisation

**LO4 Compare ways in which organisations could use management accounting to respond to financial problems.**

*Identifying financial problems:*

Using benchmarks, key performance indicators (financial and non-financial) and budgetary targets to identify variances and problems

*Financial governance:*

Definitions of financial governance, and how this can be used to pre-empt or prevent financial problems

Using financial governance to monitor strategy.

*Management accounting skill sets:*

What are the characteristics of an effective management accountant?

How can these skills be used to prevent and/or deal with problems?

*Effective strategies and systems:*

The development of strategies and systems which require effective and timely reporting, full disclosure of financial positions and are responsibly owned and governed

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>L01</b> Demonstrate an understanding of management accounting systems.			<b>D1</b> Critically evaluate how management accounting systems and management accounting reporting is integrated within organisational processes.
<b>P1</b> Explain management accounting and give the essential requirements of different types of management accounting systems.	<b>P2</b> Explain different methods used for management accounting reporting.	<b>M1</b> Evaluate the benefits of management accounting systems and their application within an organisational context.	
<b>L02</b> Apply a range of management accounting techniques.			<b>D2</b> Produce financial reports that accurately apply and interpret data for a range of business activities.
<b>P3</b> Calculate costs using appropriate techniques of cost analysis to prepare an income statement using marginal and absorption costs.	<b>P4</b> Explain the use of planning tools used in management accounting.	<b>M2</b> Accurately apply a range of management accounting techniques and produce appropriate financial reporting documents.	
<b>P4</b> Explain the advantages and disadvantages of different types of planning tools used for budgetary control.	<b>P5</b> Compare how organisations are adapting management accounting systems to respond to financial problems.	<b>M3</b> Analyse the use of different planning tools and their application for preparing and forecasting budgets.	<b>L03 L04</b> <b>D3</b> Evaluate how planning tools for accounting respond appropriately to solving financial problems to lead organisations to sustainable success.
<b>P5</b> Compare how organisations are adapting management accounting systems to respond to financial problems.	<b>P6</b> Compare ways in which organisations could use management accounting to respond to financial problems.	<b>M4</b> Analyse how, in responding to financial problems, management accounting can lead organisations to sustainable success.	

## Recommended Resources

### Textbooks

DRURY, C. (2015) *Management and Cost Accounting*. 9th edn. Boston: Cengage Learning.

EDMONDS, T. and OLDS, P. (2013) *Fundamental Managerial Accounting Concepts*. 7th edn. Maidenhead: McGraw-Hill.

HORNGREN, C., SUNDEN, G., STRATTON, W., BURGSTALLER, D. and SCHATZBERG, J. (2013) *Introduction to Management Accounting*. Global edn. Harlow: Pearson.

SEAL, W. et al. (2014) *Management Accounting*. 5th edn. Maidenhead: McGraw-Hill.

### Links

This unit links to the following related units:

*Unit 2: Business and the Business Environment*

*Unit 34: Advanced Financial Accounting*

## Unit 14: Teaching in a Specialist Subject

<b>Unit code</b>	<b>Y/616/7848</b>
<b>Unit level</b>	<b>4</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Working in the animal and agricultural industries frequently includes the delivery of material designed to educate others about the welfare of animals, from teaching in FE to working in the animal entertainment sector or owning a business. Knowledge of the principles and practices of teaching is fundamental to ensure sufficient learning.

This unit provides an introduction to the key principles of teaching and gives students the opportunity to put what they have learned into practice. Students will be provided with the opportunity to explore a range of learning theories used within teaching and gain an understanding of the ways in which lessons are structured.

Students will explore a range of delivery methods including inclusive approaches to activities within a specialist area. They will be provided with an opportunity to identify issues and management strategies relating to equality and diversity as well as behavioural management. This unit also offers the opportunity to explore the importance of using a range of assessment techniques as well as manage and develop resources to inspire. The ability to reflect will give students the chance to evaluate their own approaches to teaching and enable them to tailor this to a specialist area.

The underlying principle of the unit is to give students the opportunity to develop confidence in developing and delivering educational material within the animal management sector. During their careers students will take on roles that may require professional evaluation and working effectively with others. Students will also gain skills in dealing with issues arising out of equality and diversity along with the management of behaviour, which forms an integral part of teaching a specialist subject.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Identify the application of the theories and principles of education and training in a specialist subject
2. Develop a range of resources to enable inclusive learning
3. Demonstrate how to plan, design and construct a lesson
4. Evaluate delivery techniques and improve activities.



## Essential content

### LO1 Identify the application of the theories and principles of education and training in a specialist subject

#### *Curriculum:*

Educational/training context in specialist subject (FE College, HE, sixth form, work-based training, school visits, entertainment industry, charity work)

Delivery (knowledge-based, tutor-centred, student-centred, lecture style, research-based).

#### *Principles of learning:*

Maslow's hierarchy of needs

Behaviourists, cognitivists and humanists (Piaget, Romanowski, Kolb, Pavlov)

VAK

Inclusive learning

Bloom's taxonomy.

### LO2 Develop a range of resources to enable inclusive learning

#### *Resource design and management:*

Differentiation

Starters

Plenaries

Evaluation of own resources.

#### *Resources and activities to promote learning:*

VLE (e.g. Blackboard, Moodle)

ICT

Handouts

Case studies

Guest speakers

Educational visits

Role play

Peer working/support.

*Equality and diversity:*

Promoting equality

Challenging discriminatory behaviour

Legislation

Incorporating equality and diversity in a range of lessons.

**LO3 Demonstrate how to plan, design and construct a lesson**

*Session planning:*

Aims and objectives

Lesson planning (pace of lesson, stages, timing, variety)

Schemes of Work

Time management techniques.

*Assessment techniques:*

Initial assessment

Formative assessment

Summative assessment

Peer assessment

Ways to incorporate assessment in lessons

Feedback techniques.

**LO4 Evaluate delivery techniques and improve activities.**

*Strength and development:*

Use of reflective journals in evaluating own approaches

Reflection in action/reflection on action

Kolb's learning cycle.

*Sharing good practice:*

Team meetings, staff development days

Using feedback from others

The importance of continuing professional development

Liaising with others, experience in workplace/industry.

*The observation process:*

People who carry out observations in specialist areas

The importance of observations

Methods of observation

Formal/informal observations

Feedback process.

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>LO1</b> Identify the application of the theories and principles of education and training in a specialist subject.		<b>LO1 LO2 LO3</b>  <b>D1</b> Critically evaluate the planning and delivery process and appropriate resources applied.
<b>P1</b> Explain the various ways teaching can be implemented into own specialist subject area.  <b>P2</b> Describe a range of theories and philosophies used within teaching and learning, giving specific examples.	<b>M1</b> Analyse the different methods of delivery of education within own specialist subject area, giving both advantages and disadvantages.	
<b>LO2</b> Develop a range of resources to enable inclusive learning		
<b>P3</b> Select and produce a range of resources, including new and emerging technologies, for a minimum of two sessions in a specialist subject area.  <b>P4</b> Identify, use and evaluate appropriate resources for support in promoting equality and diversity.	<b>M2</b> Analyse the effectiveness of specific resources, reviewing both advantages and disadvantages.	
<b>LO3</b> Demonstrate how to plan, design and construct a lesson		
<b>P5</b> Plan a detailed Scheme of Work for a specialist subject area.  <b>P6</b> Provide evidence of the planning and delivery of a minimum of two different sessions.	<b>M3</b> Evaluate the use of differentiation within the planning and delivery of a minimum of two sessions.	

Pass	Merit	Distinction
<b>L04</b> Evaluate delivery techniques and improve activities.		<b>D2</b> Provide a critical evaluation and reflection of your planning and delivery of sessions.
<p><b>P7</b> Reflect on own approaches, strengths and development needs in relation to own specialist subject area.</p> <p><b>P8</b> Review the various ways in which sharing good practice can be beneficial to improve teaching and learning, giving specific examples where possible.</p>	<b>M4</b> Analyse the positive and negative outcomes of lesson planning and delivery supported by specific examples.	

## Recommended resources

### Textbooks

CURZON, L.B. (2013) *Teaching in Further Education: An Outline of Principles and Practice*. London: Bloomsbury Academic.

GRAVELLS, A. (2012) *Preparing to Teach in the Lifelong Learning Sector*. London: Learning Matters.

PETTY, G. (2014) *Teaching Today: A Practical Guide*. Cheltenham: Nelson Thornes.

PETTY, G. (2009) *Evidence-Based Teaching: A Practical Approach*. Cheltenham: Nelson Thornes.

### Websites

www.educationworld.com	Education world Whole website (General reference)
www.geoffpetty.com	Geoff Petty Whole website (General reference)
www.tes.com	TES Whole website (General reference)

### Links

This unit links to the following related units:

*Unit 5: Managing a Successful Project (Pearson-set)*

*Unit 16: Research Project (Pearson-set)*

## Unit 15: Plant Selection and Propagation

<b>Unit code</b>	<b>H/616/8047</b>
<b>Unit type</b>	<b>Core</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

The production of appropriate plant materials is an essential skill for all sectors of the industry and takes a variety of formats. While not all workers will be involved in the 'hands-on' production of plant materials, their job roles will all be linked to it, either as a supplier to this activity or as a customer of the propagated plants.

Plant quality has a large impact on all horticultural activities; the propagation of suitable plants is a fundamental phase, whether it be the striving for greater yield, producing plants of good appearance or ensuring the continuance of rare plant species, either for commercial purposes or in their natural environments.

This unit focusses on the different methods used in plant propagation, an understanding of their limitations, how success in plant propagation may be enhanced and, most importantly, the application of some of these techniques in a practical way. The development of propagation skills and knowledge will be applied in most horticultural sectors.

Propagation of plants is often the first stage in many horticultural tasks, therefore this unit will link closely with many occupational routes available to students.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Analyse the range of methods and techniques used to propagate plants
2. Evaluate the biological and plant management processes that impact upon the success of plant propagation techniques
3. Apply appropriate criteria for the selection of suitable plant material to enable successful propagation
4. Demonstrate, through practical activities, the successful propagation and initial growing on of plants.



## Essential content

### LO1 Analyse the range of methods and techniques used to propagate plants

#### *Sexual reproduction:*

Seed (in-situ (direct sown), seed trays, pricking out, thinning, potting on)

Spores

#### *Asexual reproduction:*

Cuttings (softwood, semi-ripe, hardwood, root, leaf petiole, leaf section, layering)

Grafting (side veneer, whip and tongue)

Budding (chip budding, T budding)

Division (clump division, rhizome division)

Tissue culture (explants)

Equipment required (heating system, additional light or shade, humidity regulation, moisture supply, specialist equipment linked to technique)

### LO2 Evaluate the biological and plant management processes that impact upon the success of plant propagation techniques

#### *Propagation by seed:*

Germination (moisture, temperature, oxygen, light intensity, light wavelength, time, inhibitors, depth of sowing)

Techniques to overcome inhibition (maturation of seed, soaking, stratification, heat, scarification, hormones)

Impact of environment on seedlings (light intensity & wavelength, water & humidity, temperature, growing medium)

#### *Vegetative propagation:*

Cuttings (maturity of propagation material, cell turgidity, temperature, humidity, moisture, light)

Grafting & budding (plant compatibility, timing, temperature, ripeness of wood, rootstocks)

Division (time of year, temperature, moisture)

Tissue culture (timing, hormonal control, light, temperature)

**LO3 Apply appropriate criteria for the selection of suitable plant material to enable successful propagation**

*Trueness to type:*

Management of stock plants

Reference collections

Accurate naming

*Free from pest and disease:*

Virus-free propagation material

Symptoms of pests and diseases

*Time of year:*

Maturation of wood

Impact on hormones of seasons

Temperature

*Advantages of seed:*

Large numbers

Genetic diversity

Accessibility

Storage

Cost of propagation

*Advantages of vegetative propagation:*

Genetic uniformity

Speed to maturation of plant

Control of growth through rootstocks

**LO4 Demonstrate, through practical activities, the successful propagation and initial growing on of plants**

*Seed:*

In-situ (direct sown)

Seed trays

Pricking out

Thinning

Potting on

*Cuttings:*

Softwood

Semi-ripe

Hardwood

Root

Leaf petiole

Leaf section

Grafting

*Division:*

Clump division

Rhizome division

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>L01</b> Analyse the range of methods and techniques used to propagate plants		<b>D1</b> Justify the choice of propagation techniques used for a range of plants.
<b>P1</b> Analyse the range of methods used in propagation from seed. <b>P2</b> Analyse a range of methods used in vegetative propagation.	<b>M1</b> Critically analyse the appropriateness of a range of propagation techniques for specific plants.	
<b>L02</b> Evaluate the biological and plant management processes that impact upon the success of plant propagation techniques.		<b>D2</b> Critically evaluate the design of a propagation system in its effectiveness in meeting the needs of a specific plant.
<b>P3</b> Describe the biological processes that underpin the successful germination of seeds. <b>P4</b> Describe the biological processes that impact upon the successful vegetative propagation of plants.	<b>M2</b> Evaluate how plant production processes could be managed to increase their success rates.	
<b>L03</b> Apply appropriate criteria for the selection of suitable plant material to enable successful propagation.		<b>D3</b> Provide a detailed commercial justification for the propagation methods chosen for named plant cultivars.
<b>P5</b> Select appropriate propagation techniques for a range of plants. <b>P6</b> Produce a detailed propagation plan for a range of named plant cultivars.	<b>M3</b> Evaluate the propagation plan developed for a range of named plant cultivars.	

Pass	Merit	Distinction
<b>LO4</b> Demonstrate, through practical activities, the successful propagation and initial growing on of plants.		<b>D4</b> Justify recommendations for improvement in effectiveness of current propagation systems.
<b>P7</b> Demonstrate proficiency in appropriate techniques to enable the establishment of a range of plants from seed.  <b>P8</b> Demonstrate proficiency in appropriate techniques of vegetative propagation.	<b>M4</b> Evaluate the effectiveness of current propagation systems.	

## Recommended resources

### Textbooks

DIRR, M.A. and HEUSER, C.W. (2006) *Reference Manual of Woody Plant Propagation: From Seed to Tissue Culture*. Newton Abbot: Timber Press.

HARTMANN, H.T and KESTER, D.E. (2013) *Hartmann & Kester's Plant Propagation: Pearson New International Edition: Principles and Practices*. Harlow: Pearson.

TOOGOOD, A.R. (2003) *RHS Propagating Plants*. 2nd revised edn. London: Dorling Kindersley.

MASON, J. (2004) *Nursery Management*. 2nd edn. London: Landlinks Press.

### Websites

www.ipps.org	International Plant Propagators Society (IPPS) Homepage (Up-to-date scientific and commercial propagation information)
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### Links

This unit links to the following related units:

*Unit 6: Principles of Crop Production*

*Unit 8: Protective Crop Production*

*Unit 3: Plant Identification and Classification*

*Unit 29: Plant Breeding and Genetics*

## Unit 16: Research Project (Pearson-set)

<b>Unit code</b>	<b>R/616/7850</b>
<b>Unit type</b>	<b>Core</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>30</b>

### Introduction

This unit is assessed by a Pearson-set assignment. Students will choose their own project based on a theme provided by Pearson (this will change annually). The project must be related to their specialist pathway of study (unless the student is studying a general pathway). This will enable students to explore and examine a relevant and current topical aspect of business in the context of the Land-based business environment and their chosen specialist pathway.

The aim of this unit is to offer students the opportunity to engage in sustained research in a specific field of study. The unit enables students to demonstrate the capacity and ability to identify a research theme, develop research aims, objectives and outcomes, and to present the outcomes of such research in both written and verbal formats. The unit also encourages students to reflect on their engagement in the research process, during which recommendations for future, personal development are key learning points.

On successful completion of this unit students will have the confidence to engage in problem-solving and research activities which are part of the function of a manager. Students will have the fundamental knowledge and skills to enable them to investigate workplace issues and problems, determine appropriate solutions and present evidence to various stakeholders in an acceptable and understandable format.

**Please refer to the accompanying Pearson-set Assignment Guide and the Theme Release document for further support and guidance on the delivery of the Pearson-set unit.**

## **Learning Outcomes**

By the end of this unit a student will be able to:

1. Examine appropriate research methodologies and approaches as part of the research process
2. Conduct and analyse research relevant for a Land-based business research project
3. Communicate the outcomes of a research project to identified stakeholders
4. Reflect on the application of research methodologies and concepts.



## Essential Content

### LO1 **Examine appropriate research methodologies and approaches as part of the research process**

#### *Developing a research proposition:*

The importance of developing methodical and valid propositions as the foundation for a research project

Rationale e.g. the purpose and significance for research question or hypothesis

The value of the philosophical position of the researcher and the chosen methods

Use of Saunders's research onion as a guide to establishing a methodological approach

#### *Literature review:*

Conceptualisation of the research problem or hypothesis

The importance of positioning a research project in the context of existing knowledge

Significance and means of providing benchmarks by which data can be judged

#### *Qualitative, quantitative and mixed method research:*

Key theoretical frameworks for research

Advantages and limitations of qualitative and quantitative research approaches and methods

### LO2 **Conduct and analyse research relevant for a Land-based business research project**

#### *Research as a process:*

Research has distinct phases which support a coherent and logical argument e.g. using secondary research to inform a primary empirical study

#### *Selecting a sample:*

The importance of gathering data and information (qualitative or quantitative) to support research analysis

Selecting sample types and sizes that are relevant to the research

Considering sampling approaches and techniques e.g. probability and non-probability sampling

*Ethics, reliability and validity:*

Research should be conducted ethically – how is this achieved and reported?

Research should also be reliable (similar results would be achieved from a similar sample) and valid (the research measures what it aimed to measure)

*Analysing data:*

Using data collection tools e.g. interviews and questionnaires

Using analytical techniques e.g. trend analysis, coding or typologies

**LO3 Communicate the outcomes of a research project to identified stakeholders**

*Stakeholders:*

Who are they?

Why would they be interested in the research outcomes?

What communication method do they expect?

*Communicating research outcomes:*

Consideration of different methods of communicating outcomes (e.g. written word, spoken word) and the medium (e.g. report, online, presentation)

The method and medium will be influenced by the research and its intended audience

*Convincing arguments:*

No matter what the method/medium, all research should be convincing and presented logically where the assumption is that the audience has little or no knowledge of the research process

The importance of developing evaluative conclusions

#### LO4 **Reflect on the application of research methodologies and concepts.**

##### *Reflection for learning and practice:*

Difference between reflecting on performance and evaluating a research project – the former considers the research process, the latter considers the quality of the research argument and use of evidence

Reflection on the merits, limitations and potential pitfalls of the chosen methods

##### *The cycle of reflection:*

Reflection in action and reflection on action

Considering how to use reflection to inform future behaviour and future considerations

##### *Reflective writing:*

Avoiding generalisation and focusing on personal development and the research journey in a critical and objective way

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>L01</b> Examine appropriate research methodologies and approaches as part of the research process		<b>L01 L02</b> <b>D1</b> Critically evaluate research methodologies and processes in application to a business research project to justify chosen research methods and analysis.
<b>P1</b> Produce a research proposal that clearly defines a research question or hypothesis supported by a literature review. <b>P2</b> Examine appropriate research methods and approaches to primary and secondary research.	<b>M1</b> Evaluate different research approaches and methodology and make justifications for the choice of methods selected based on philosophical/theoretical frameworks.	
<b>L02</b> Conduct and analyse research relevant for a Land-based business research project.		
<b>P3</b> Conduct primary and secondary research using appropriate methods for a business research project that considers costs, access and ethical issues. <b>P4</b> Apply appropriate analytical tools, analyse research findings and data.	<b>M2</b> Discuss merits, limitations and pitfalls of approaches to data collection and analysis.	
<b>L03</b> Communicate the outcomes of a research project to identified stakeholders.		<b>D2</b> Communicate critical analysis of the outcomes and make valid, justified recommendations.
<b>P5</b> Communicate research outcomes in an appropriate manner for the intended audience.	<b>M3</b> Coherently and logically communicate outcomes to the intended audience, demonstrating how outcomes meet set research objectives.	

Pass	Merit	Distinction
<b>L04</b> Reflect on the application of research methodologies and concepts.		<b>D3</b> Demonstrate reflection and engagement in the research process, leading to recommended actions for future improvement.
<b>P6</b> Reflect on the effectiveness of research methods applied for meeting objectives of the business research project.  <b>P7</b> Consider alternative research methodologies and lessons learnt in view of the outcomes.	<b>M4</b> Provide critical reflection and insight that results in recommended actions for improvements and future research considerations.	

## Recommended Resources

### Textbooks

COSTLEY, C., ELLIOT, G. and GIBBS, P. (2010) *Doing Work Based Research: Approaches to Enquiry for Insider-researchers*. London: SAGE.

FLICK, U. (2011) *Introducing Research Methodology: A Beginner's Guide to Doing a Research Project*. London: SAGE.

GRAY, D. (2009) *Doing Research in the Real World*. 2nd edn. London: SAGE.

SAUNDERS, M., LEWIS, P. and THORNHILL, A. (2012) *Research Methods for Business Students*. 6th edn. Harlow: Pearson.

### Websites

www.eajournals.org	European American Journals
	International Journal of Quantitative and Qualitative Research
	(Journal)
www.emeraldinsight.com	Emerald Insight
	Qualitative Research Journal (Journal)

### Links

This unit links to the following related units:

*Unit 5: Managing a Successful Project (Pearson-set)*

## Unit 17: Professional Garden Design

<b>Unit code</b>	<b>K/616/8048</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

A professional garden designer requires many skills such as being able to analyse sites for a project and utilise the information gleaned from the analysis to produce an aesthetically pleasing design that is fit for purpose. Additionally, the designer must be aware of correct methods of construction and the cost implication of selecting different materials and construction techniques. Professional garden design is a blend of creative flair and practicality.

This unit will enable students to identify and understand the key stages of garden design and their application to the design project. Students will also be able to identify, measure and record the factors that need to be considered when conducting a site analysis.

Students will be able to apply the principles of garden design such as unity and harmony and appreciate how they contribute to a successful composition.

Students will be able to produce accurate scale drawings that have a professional appearance using conventional drafting techniques and Computer Aided Design (CAD) software. The accuracy of these drawings enhanced by cross sections showing construction detail will allow landscape contractors to calculate accurate costings for implementing the design.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Discuss how the key stages of professional garden design lead to the finished project
2. Explain how a site analysis facilitates the design process
3. Interpret the principles of garden design to produce designs that are aesthetically pleasing, and are appropriate for the site
4. Explain how to produce a garden design that is fit for purpose and can generate accurate costings for a contractor.



## Essential content

### LO1 Discuss how the key stages of professional garden design lead to the finished project

#### *Concept:*

The idea behind the design (style, philosophy, approach, etc.)

#### *Site analysis:*

Information from within the site and outside

Soil and climatic data

Views

Eyesores

Existing features

#### *Client brief:*

What the client and stakeholders want

Practical considerations (storage, entertaining, children's play areas, maintenance)

#### *Master plan:*

The synthesis of site and concept

A simple layout giving an overview of the design

#### *Hard landscape plan:*

Fencing, walling decking, paths

The shape, size and choice of materials for hard landscape elements

#### *Planting plan:*

The location, number and selection of plants

LO2 Explain how a site analysis facilitates the design process

Chain survey and triangulation

Electronic measurement devices

Measurement of levels using laser levels, optical levels and measuring rods

Existing vegetation

Hard surfaces

Features

Views and eyesores

Location of services

Noise from outside the site

Aspect

Climate and microclimate

Future developments outside the site that will have effect

Planning and legal constraints (conservation areas, tree preservation orders, covenants, protected habitats and species)

**LO3 Interpret the principles of garden design to produce designs that are aesthetically pleasing, and are appropriate for the site**

*Unity:*

The interaction of the design elements

Congruity.

*Rhythm:*

Alternation or repetition of elements to create predictability.

*Scale:*

Proportion

The size of one object in proportion to another

The relationship between scale and speed.

*Harmony:*

Elements relating to and complementing each other

Harmonious colour schemes.

*Proportion:*

The relative size and scale of the various design elements

Principle of proportion.

*Balance:*

Distribution of visual weight of objects

Symmetrical, asymmetrical and radial balance

*Variety:*

Interest

Contrast

Excitement

'Wow factor'

Contrasting colours

**LO4 Explain how to produce a garden design that is fit for purpose and can generate accurate costings for a contractor.**

Use of appropriate scale

Drawing and CAD software

Symbols, graphics and detailing

The use of cross sections detailing construction

Detailed planting plans

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>L01</b> Discuss how the key stages of professional garden design lead to the finished project			<b>D1</b> With reference to a specific project with an identified site and a client brief, evaluate the stages of the design process and how the challenges were overcome.
<b>P1</b> Explain the key stages of a garden design and how they inform the design process.		<b>M1</b> Using working documentation and annotated diagrams, plan the key stages of garden design for a specific design project.	
<b>P2</b> With reference to a specified site, explain the relationship between the site, customer brief and the designer's concept.			
<b>L02</b> Explain how a site analysis facilitates the design process.			<b>D2</b> Conduct a site analysis encompassing the features identified in P3, P4 and M2 to be retained including large specimen trees, herbaceous and shrub plantings and other features. The analysis should contain detailed information on soil, microclimate and wildlife.
<b>P3</b> Conduct a site analysis for a small urban garden on a flat site, explaining the process and how the required information was obtained.		<b>M2</b> Conduct a site analysis on a large irregular garden using a chain survey and triangulation to provide an accurate plan on the site, locating key features such as buildings, boundaries and existing trees and features to be retained.	
<b>P4</b> Conduct a site analysis for a sloping site using surveying equipment and record levels to inform the design process.			
<b>L03</b> Interpret the principles of garden design to produce designs that are aesthetically pleasing, and are appropriate for the site.			<b>D3</b> Produce a garden design that includes detailed planting plans and includes three dimensional drawings and cross sections to aid interpretation.
<b>P5</b> Produce a garden design drawn to scale which incorporates the main principles of garden design.		<b>M3</b> Produce a garden design showing a professional level of detailing and presentation.	
<b>P6</b> Produce a garden design including cross sections showing construction detail of walls and surfaces.			

Pass	Merit	Distinction
<b>LO4</b> Explain how to produce a garden design that is fit for purpose and can generate accurate costings for a contractor.		<b>D4</b> Provide a garden plan that specifies quantities of materials needed and gives a precise specification of hard landscape materials, subbase, soil, turf and plant materials needed to ensure that the finished project is carried out to the correct standard.
<b>P7</b> Provide a garden plan that enables accurate costings through accuracy and precise specification of materials.  <b>P8</b> Provide a garden design explaining how the site, brief and concept were used to create the final design.	<b>M4</b> Produce a garden plan that shows methods of construction that are compliant with national standards, codes of practice and recognised best industry practice.	

## Recommended resources

### Textbooks

ALBRECHT, L. (2010) *You Want To Be a Garden Designer*. Newton Abbot: Timber Press.

ALEXANDER, R. (2017) *The Garden Design Workbook*. Newton Abbot: Timber Press.

BROOKES, J. (2007) *Room Outside. New Approach to Garden Design*. London: Garden Art Press.

CLOUSTON, B. (2013) *Landscape Design with Plants*. Oxford: Newnes.

LITTLEWOOD, M. (1986) *Landscape Detailing*. New York: Wiley.

MCCORMACK, T. (2011) *Driveways, Paths and Patios. A Complete Guide to Design, Management and Construction*. Marlborough: Crowood.

OULDORF, P. and KINGSBURY, N. (2013) *Planting: A New Perspective*. Newton Abbot: Timber Press.

REID, G. (2012) *Landscape Graphics: Plan, Selection and Perspective Drawing of Landscape Spaces*. New York: Watson Gupthill.

WOODHAMS, S. (2015) *Garden Design Solutions*. London: Jacqui Small LLP.

### Websites

<a href="http://www.bali.org.uk">www.bali.org.uk</a>	British Association of Landscape Industries Homepage General reference
<a href="http://www.landscapeinstitute.org">www.landscapeinstitute.org</a>	Landscape Institute Homepage General reference
<a href="http://www.landscaper.org.uk">www.landscaper.org.uk</a>	Association of Professional Landscapers Homepage General reference
<a href="http://www.rhs.org.uk">www.rhs.org.uk</a>	Royal Horticultural Society Homepage General reference
<a href="http://www.sgd.org.uk">www.sgd.org.uk</a>	Society of Garden Designers Homepage General reference

## **Links**

This unit links to the following related units:

*Unit 18: Professional Garden Design Practice*

## Unit 18: Professional Garden Design Practice

<b>Unit code</b>	<b>M/616/8049</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Managing a garden design business requires a lot more than purely design skills. An understanding of the law relating to garden design is necessary to ensure legal and contractual compliance. Designers must be aware of the consumer rights of private clients as well as their safety responsibilities and obligations under business contract law. Additionally, working with professional bodies requires compliance with codes of practice and standards of professional ethics.

Drafting contracts with private clients and landscape contractors needs careful consideration to ensure projects are carried out efficiently and equitably. A designer needs to be able to cost hard and soft landscape work with a reasonable level of accuracy to ensure that the project is within the budget specified by the client and to monitor the value offered by landscape contractors. Costs can be estimated by industry manuals and specialist software. Garden designers must update their competence on a continual basis through professional development and identify and utilise opportunities to enhance their competence.

Students will develop an understanding of the key pieces of legislation that affect the operation of a garden design practice such as planning laws, construction design and management regulations, and making contracts with landscapers and clients. Students will also develop an ability to monitor the financial performance of their business and ensure that it remains solvent by using financial tools such as a cash flow analysis and a profit and loss account.

Students will also be able to estimate the cost of a garden design proposal using a variety of methods including specialist computer software and industry-specific pricing manuals. Students will develop an awareness of the importance of continuous professional development and earning a reputation as a garden designer throughout their careers.



## **Learning Outcomes**

By the end of this unit students will be able to:

1. Describe and explain the legal, ethical and regulatory compliance in a garden design business
2. Evaluate the structure and business requirements of a garden design practice
3. Identify the costs associated with garden design projects necessary to produce estimates and budgets
4. Demonstrate the importance of professional development and reputation as a garden designer.

## Essential content

### LO1 **Describe and explain the legal, ethical and regulatory compliance in a garden design business**

Construction design and management regulations

Consumer and business contract law

Alternative Dispute Resolution (ADR)

Statutory, expressed and implied terms

Custom and practice

Planning laws

Conservation areas

Tree preservation orders

Professional indemnity and liability insurance

British standards and codes of practice

Professional bodies – codes of conduct

Environmental responsibility

Sustainability

### LO2 **Evaluate the structure and business requirements of a garden design practice**

*Business structure:*

Sole trader, partnership or limited company as relating to professional garden design

Legally compliant contracts with consumers, businesses and contractors

Tender documents

Engage with professional bodies

Promote the business in a cost-efficient and ethical manner

*Monitor profitability:*

Cash flow forecast

Profit and loss account

**LO3 Identify the costs associated with garden design projects necessary to produce estimates and budgets**

Industry-standard pricing handbooks

Specialist pricing software

Analysis of historical contractor estimates and quotations

Factors that can add cost to standard projects (access, geographical location, local economy, local government policies and taxation)

Estimates, quotations and margins

Acceptable levels of accuracy

Fixed and variable costs

**LO4 Demonstrate the importance of professional development and reputation as a garden designer.**

Participation in professional body activities

Awards and accreditations

Networking with other designers

Professional development goals

Self-assessment, peer assessment

Benchmarking progress

Developing a professional reputation (writing, giving Lectures and seminars)

Using social media as a promotional tool

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>L01</b> Describe and explain the legal, ethical and regulatory compliance in a garden design business		<b>M1</b> Interpret consumer and contract law within the context of professional garden design to provide concise and clear guidance for a practitioner.	<b>D1</b> Critically analyse the relationship between the key statutes and trade body ethical standards and good business practice.
<b>P1</b> Discuss the key statutes relating to professional garden design practices and the benefits for compliance, and the possible sanctions for non-compliance.  <b>P2</b> Explain the benefits of ethical compliance for a garden design practice with specific examples.			
<b>L02</b> Evaluate the structure and business requirements of a garden design practice.		<b>M2</b> Develop a series of key performance indicators for a design practice, justifying reasoning.	<b>D2</b> Critically evaluate a selection of design businesses and produce a model of best industry practice.
<b>P3</b> Plan the establishment of a garden design business, specifying the choice of business structure, formulating contract documentation and professional development strategies.  <b>P4</b> Analyse the effectiveness of different financial management tools to monitor profitability.			
<b>L03</b> Identify the costs associated with garden design projects necessary to produce estimates and budgets.		<b>M3</b> Evaluate different pricing models, making recommendations for their suitability for different types of design project.	<b>D3</b> Critically evaluate different pricing systems, contrasting their performance in terms of ease of use, procurement cost and accuracy.
<b>P5</b> Cost a design project using bespoke software.  <b>P6</b> Cost a design project using industry pricing handbooks.			

Pass	Merit	Distinction
<b>L04</b> Demonstrate the importance of professional development and reputation as a garden designer.		<b>D4</b> By using critical analysis, formulate a continuous professional development scoring system for a design industry body, justifying decisions.
<p><b>P7</b> Identify a significant career development opportunity, explaining its value in developing competence and knowledge.</p> <p><b>P8</b> Demonstrate how a garden designer can build his or her professional reputation as a garden designer and promote the business.</p>	<b>M4</b> Evaluate different opportunities for continuous professional development, comparing their relative advantages and disadvantages.	

## Recommended resources

### Textbooks

ALBRECHT, L. (2010) *So You Want to Be a Garden Designer*. Newton Abbot: Timber Press.

McCORMACK, T. (2011) *Driveways, Paths and Patios. A Complete Guide to Design, Management and Construction*. Marlborough: Crowood.

ROWLAND FRASER, G. (2015) *Landscape Professional Practice*. Abingdon: Routledge.

VERNON, S. (2015) *Professional Practice for Landscape Architects*. Abingdon: Routledge.

VERNON, S. (2013) *Landscape Architect's Pocket Book*. Abingdon: Routledge.

### Websites

<a href="http://www.bali.org.uk">www.bali.org.uk</a>	British Association of Landscape Industries Homepage (General reference)
<a href="http://www.landscapeinsitute.org">www.landscapeinsitute.org</a>	Landscape Institute Homepage (General reference)
<a href="http://www.landscaper.org.uk">www.landscaper.org.uk</a>	Association of Professional Landscapers Homepage (General reference)
<a href="http://www.rhs.org.uk">www.rhs.org.uk</a>	Royal Horticultural Society Homepage (General reference)
<a href="http://www.sgd.org.uk">www.sgd.org.uk</a>	Society of Garden Designers Homepage (General reference)

## **Links**

This unit links to the following related units:

*Unit 11: Human Resource Management*

*Unit 13: Management Accounting*

*Unit 17: Professional Garden Design*

*Unit 19: Planning and Implementation of Hard Landscapes*

*Unit 34: Advanced Financial Accounting*

## Unit 19: Planning and Implementation of Hard Landscapes

<b>Unit code</b>	<b>H/616/8050</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Plants form the basis of horticultural practice and aesthetics. However, the framework and context in which they are presented is heavily influenced by hard landscaping features. The balance between soft and hard landscaping features is one which garden designers strive to achieve, often resulting in spectacular and inspirational gardens.

This unit will introduce students to the use and construction of hard landscaping features and elements through the development of a small garden construction project. Students will develop the skills needed to work in a realistic work-based environment and will be able to integrate skills and knowledge from other horticultural disciplines. Students will research and evaluate a range of materials used in gardens and will investigate how they are used functionally and aesthetically. Principally, the unit will develop hard landscaping skills and knowledge, but in the context of an overall design project. Students will gain an appreciation of how hard landscaping features enhance and complement other garden features.

Students will develop their practical construction skills which will include managing a contract, project management and site construction skills. They will manage all aspects of the project from planning to handover. Students will also consider current Health and Safety and legislation that may impact on the project.



## **Learning Outcomes**

By the end of this unit students will be able to:

1. Evaluate the range of hard landscape features and elements used in designed landscapes and gardens
2. Manage the use and construction of hard landscape features
3. Plan hard landscape construction
4. Manage a construction project containing hard elements.

## Essential content

### LO1 **Evaluate the range of hard landscape features and elements used in designed landscapes and gardens**

#### *Materials and use of materials:*

Hard surfaces (bricks, blocks, paving slabs)

Timber

Enclosures (walls, fencing, trellis)

Ornamental features (water features, gazebos, pergola, ornaments/statues)

Conventional and traditional materials (rocks, plastics, steel, aluminium, glass)

Range of data sources, web pages, ROMs, books, publications, television, mobile applications and devices

Future use of materials e.g. rigid and flexible materials, historic and contemporary context, sourcing of materials and concept of sustainability

### LO2 **Manage the use and construction of hard landscaping features**

#### *Materials surfaces, boundaries and features:*

Materials e.g. combined and structured to create features (paving, enclosures, raised areas, sunken areas), water features, evaluation and selection of materials, aesthetical considerations, cost, performance and longevity

Hard surfaces outdoors (soil analysis and methods, sub base construction, blinding, bedding for surfaces, falls and levels, dealing with surface water runoff, ramps, steps, on-site safety)

Enclosures and walls e.g. brickwork, blockwork, stonework, height to thickness, mortars, jointing and pointing, foundations, damp proofing, fencing types and styles (strained wire, post and rail, panel, picket, decorative), natural screening (hedgerows, living willow, thatch, bamboo, hazel and chestnut hurdles)

Landscaping features (raised areas - beds, seating, decking, boardwalks), sunken areas (ponds, marshy areas), water features.

### LO3 **Plan hard landscape construction**

#### *Project planning:*

Office and site-based work

Project planning

Critical path planning

Resource requirements

Budgetary control

Work planning

Health and Safety and risk assessments

Management

Staff

Customers

Contractors

Budgets

Machinery and equipment (own and hired)

Licensed operatives

Health and Safety procedures

Stages of work

Site preparation

Construction

Handover

#### LO4 **Manage a construction project containing hard elements.**

*Contract and project management skills:*

Site identification

Analysis for project development

Health and Safety regulations and assurance

Construction (design and management) Regulations (CDM) 2015 Client relationships

Project management e.g. recording techniques, site survey, levelling techniques, contract specifications, fee and payment arrangements

Site construction, earth moving (handling, storage, removal, disposal), construction skills, ordering, delivery, storage, time constraints, assessment of quality and signing off

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>LO1</b> Evaluate the range of hard landscape features and elements used in designed landscapes and gardens.		<b>D1</b> Critically evaluate and justify the range of materials available for hard surfaces, enclosures and ornamental features.
<b>P1</b> Describe the range of materials available for hard surfaces. <b>P2</b> Describe the range of materials available to create enclosures. <b>P3</b> Describe the range of materials available for ornamental features.	<b>M1</b> Analyse the range of materials available for hard surfaces, enclosures and ornamental features.	
<b>LO2</b> Manage the use and construction of hard landscape features.		
<b>P4</b> Describe the use of materials, construction and key features of a range of hard surfaces. <b>P5</b> Describe the use of materials, construction and key features of a range of wall and fence enclosures.	<b>M2</b> Justify the use of landscape features at given sites.	<b>D2</b> Critically evaluate the construction type and quality of a range of landscape features.
<b>LO3</b> Plan hard landscape construction.		
<b>P6</b> Plan a small landscape project to given specifications. <b>P7</b> Discuss appropriate resource requirements for a small landscape project to include costs and budgetary control.	<b>M3</b> Summarise the necessary Health and Safety and construction (design and management) documentation for a small landscape project.	<b>LO3 LO4</b> <b>D3</b> Critically evaluate and reflect on own performance throughout project to inform own actions.
<b>LO4</b> Manage a construction project containing hard elements.		
<b>P8</b> Demonstrate a range of landscape construction skills for a given hard landscape project.	<b>M4</b> Manage people, budgets, machinery, equipment, health, safety and environment effectively.	

## Recommended resources

### Textbooks

ALEXANDER, R. and BATSTONE, K. (2006) *A Handbook for Garden Designers*. London: Cassell Illustrated.

BLAKE, J. (1999) *Introduction to Landscape Design and Construction*. Aldershot: Gower Publishing.

BRICKELL, C. (2006) *The RHS Essential Garden Planning and Construction*. London: Mitchell Beazley Publishing.

CLIFTON, J. (2011) *Stone, Wood, Glass and Steel: Inspirational and Practical Design Ideas and Techniques Using Hard Landscaping Materials*. London: Aquamarine Publishing.

McCORMACK, T. (2005) *Driveways, Paths and Patios: A Complete Guide to Design, Management and Construction*. Ramsbury: The Crowood Press Ltd.

POWELL, A. (2003) *Hard Landscaping for the Garden*. Newton Abbot: David and Charles Publishing.

POWELL, A. (2001) *Hardscape: Innovative Hard Landscaping Materials for Gardens*. Newton Abbott: David and Charles Publishing.

### Websites

[www.aecb.net](http://www.aecb.net)

The Association for Environment  
Conscious Building (AECB)

Homepage

General reference

[www.bali.org.uk](http://www.bali.org.uk)

The British Association of Landscape  
Industries (BALI)

Homepage

General reference

[www.gardenersworld.com/search](http://www.gardenersworld.com/search)

BBC Gardeners World

Homepage

General reference

[www.landscaper.org.uk](http://www.landscaper.org.uk)

The Association of Professional  
Landscapers (APL)

Homepage

General reference

www.pavingexpert.com	Paving Expert
	Homepage
	General reference
www.hortweek.com	Horticulture Week
	Homepage
	News & Analysis
landscapermagazine.com	Landscaper Magazine
	Homepage
	News & Features

## Links

This unit links to the following related units:

*Unit 17: Professional Garden Design*

*Unit 18: Professional Garden Design Practice*

*Unit 20: Landscape and Garden Maintenance*

## Unit 20: Landscape and Garden Maintenance

<b>Unit code</b>	<b>K/616/8051</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Demand for quality garden and landscape maintenance has increased in recent years. Planning demands for landscape schemes to complement residential and commercial development, reduced leisure time for the general public and the demographic increase in retired homeowners wanting professional help in their gardens have all helped to fuel this demand. As the market has increased, so has the number of businesses offering garden and landscape maintenance, creating a competitive business environment.

A landscape and garden maintenance contractor will need to ensure an efficient operation, control costs, maximise revenue and maintain good professional standards. Additionally, safety must be managed effectively, including risk assessments. Landscape and garden maintenance plans need to take into account good horticultural practices, budgetary constraints and the needs and expectations of clients and stakeholders. Safe and efficient working practices need the support of the right equipment that is carefully sourced and evaluated, using well-considered selection criteria.

Contractors need to monitor the quality of their service using self or external assessment and establish benchmarks where possible. Self-assessment is a useful tool when there is not an external quality audit by the customer. Being able to price work effectively is also essential. If work is priced too low, the consequence can be financial loss and if the price is too high, the business can lose out to competitors. Students will be able to evaluate different pricing systems and their relative advantages and limitations.

Students will be able to plan garden and maintenance schedules according to best professional practice, adapting operations to the needs of various plant groups, hard surfaces and features. Additionally, they will be able to source machinery and equipment by identifying and utilising selection criteria. Students will also be able to monitor the quality of garden and landscape maintenance and ensure that operations are carried out profitably.



## **Learning Outcomes**

By the end of this unit students will be able to:

1. Plan the maintenance of private gardens and public and open spaces according to the site, customer requirements and industry best practice
2. Evaluate equipment for garden and landscape maintenance
3. Assess the quality of landscape and garden maintenance
4. Identify the costs involved to calculate accurate estimates for garden and landscape maintenance contracts and monitor profitability.

## Essential content

### LO1 **Plan the maintenance of private gardens and public and open spaces according to the site, customer requirements and industry best practice**

Short (one year) and long-term (two to five year) plans

Budgets from clients or organisational needs

The maintenance of trees, shrubs, herbaceous perennials, seasonal display plants

Hard surfaces e.g. paving, decking and fluid materials

Ponds and water features, both naturalistic and formal

Garden and landscape features (fencing, gazebos, pergolas, sculpture and artwork)

### LO2 **Evaluate equipment for garden and landscape maintenance**

Mowers e.g. ride-on and pedestrian

Nylon cord trimmers

Hedge cutters, blowers

Shredders and chippers

Chainsaws hand tools

Diesel and petrol powered equipment

Two and four-stroke machinery, rechargeable electric

Associated Personal Protective Equipment

Dealer support (training, warranties, etc).

### LO3 **Assess the quality of landscape and garden maintenance**

Self-assessment using bespoke software

Client and stakeholder feedback

Service level agreements and key performance indicators

External quality audits

Quantitative and qualitative data

**LO4 Identify the costs involved to calculate accurate estimates for garden and landscape maintenance contracts and monitor profitability**

Using cost plus, market and image pricing

The advantages and disadvantages of each of the three pricing models

Cost analysis

Fixed and variable costs

Historical records and accounts.

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>LO1</b> Plan the maintenance of private gardens and public and open spaces according to the site, customer requirements and industry best practice.			<b>D1</b> Investigate emerging trends in garden and landscape maintenance, showing how these can help to reconcile operational needs, stakeholder's expectations and sustainability, with reference to planning and evaluation conducted in P1 and M1.
<b>P1</b> Plan the maintenance of a large private garden with trees, shrubs and herbaceous perennials, describing the necessary tasks and specifying the timing of operations.	<b>P2</b> Plan the maintenance of hard surfaces and features of a landscaped area with public access.	<b>M1</b> Evaluate the effectiveness of different maintenance regimes to provide aesthetically pleasing results and operational efficiency.	
<b>LO2</b> Evaluate equipment for garden and landscape maintenance			<b>D2</b> Critically evaluate one sector of garden or landscape machinery in terms of safety and efficiency.
<b>P3</b> Justify the selection of a particular piece of garden machinery for a specific project, explaining decisions.	<b>P4</b> Describe the selection criteria for procuring garden and landscape maintenance equipment in terms of efficiency, cost effectiveness and longevity.	<b>M2</b> Evaluate two different machines designed for the same purpose to provide guidance on suitability.	
<b>LO3</b> Assess the quality of landscape and garden maintenance.			<b>D3</b> Critically assess a quality monitoring system for landscape and garden maintenance, providing quantitative data and key performance indicators.
<b>P5</b> Identify criteria used to assess the quality of garden and landscape maintenance.	<b>P6</b> Explain the relative advantages of internal and external monitoring of the quality of landscape and garden maintenance.	<b>M3</b> Research a quality monitoring system used by clients and propose improvements.	

Pass	Merit	Distinction
<b>LO4</b> Identify the costs involved to calculate accurate estimates for garden and landscape maintenance contracts and monitor profitability.		<b>D4</b> Critically evaluate a garden or landscape maintenance contract, suggesting improvements without adversely affecting quality or profitability.
<b>P7</b> Discuss different pricing models and their relative merits and demerits.  <b>P8</b> Price a simple garden or maintenance contract to ensure profitability, justifying reasoning.	<b>M4</b> Evaluate a maintenance contract and explain how profitability will be measured.	

## Recommended resources

### Textbooks

AECOM (2018) *Spon's External Works and Landscape Price Book*. Abingdon: Taylor and Francis.

BRICKELL, C. (2016) *RHS Encyclopaedia of Garden Plants*. London: DK.

BRICKELL, C. and JOYCE, D. (2017) *Pruning and Training*. London: DK.

PARKER, J. and BRYAN, P. (1990) *Landscape Management and Maintenance. A Guide to Its Costing and Organisation*. Abingdon: Routledge.

POWER, P. (2015) *Start and Run a Gardening Business*. London: Robinson.

### Websites

www.bali.org.uk	British Association of Landscape Industries Homepage (General reference)
www.hortweek.com	Horticulture Week Homepage (General reference)
www.IOG.org.uk	Institute of Groundsmanship Homepage (General reference)
www.landscaper.org	Association of Professional Landscapers Homepage (General reference)
www.liber8.co.uk	Liberate pricing software Homepage (General reference)
www.pgg.org.uk	Professional Gardeners Guild Homepage (General reference)
www.rhs.org.uk	Royal Horticultural Society Homepage (General reference)

## **Links**

This unit links to the following related units:

*Unit 9: Land-based Machinery and Technology*

*Unit 10: Rural Business Administration and Accounting*

*Unit 13: Management Accounting*

*Unit 21: Habitat Restoration and Repair*

## Unit 21: Habitat Restoration and Repair

<b>Unit code</b>	<b>M/616/8052</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

The survival of specialist species depends on the provision of high quality habitats. Habitats that have become degraded need to be restored, and, in many cases, new habitats must be created. The impacts on habitats globally from agriculture, forestry and urban development are well documented and the importance of restoring these habitats, particularly where they may benefit humans, has now led to the relatively new discipline of restoration ecology.

The purpose of this unit is to enable students to develop their knowledge and understanding of the processes of habitat restoration and creation. The unit will draw on current research and best practice from restoration projects across the globe. Students will critically evaluate the effectiveness of these techniques in terms of their ecological value and will gain an understanding of the wider benefits of successful habitat restoration projects.

The content of the unit explores the rationale for restoring and creating habitats and provides a thorough review and analysis of the techniques available. Considerable emphasis is placed upon the selection of appropriate species for habitat creation programmes.

By the end of the unit students will be able to assess habitats and make recommendations for their improvements to meet biodiversity, ecosystem and social objectives.



## **Learning Outcomes**

By the end of this unit students will be able to:

1. Explain the strategic importance of habitat restoration and repair
2. Evaluate the principles involved in the creation and restoration of habitats
3. Evaluate appropriate species for habitat restoration and creation
4. Assess land use options for a range of habitat types.

## Essential content

### LO1 Explain the strategic importance of habitat restoration and repair

*UK habitats:*

Overview

Geographical influences and distribution

Plagioclimax communities

Communities

Post-glacial development of UK habitats

Human influences e.g. concept and development of semi-natural habitats, habitat degradation and fragmentation

Habitat restoration e.g. definition and concept, reasons and rationale for habitat restoration, assessing potential for restoration, Site of Special Scientific Interest, National Parks, NNRs, LNRs, AONBs, Improvement Programme

### LO2 Evaluate principles involved in the restoration and creation of habitats

*Natural and human-induced restoration:*

Natural habitat restoration

Habitat creation

Role and processes of ecological succession

Natural regeneration e.g. invasive species

Human-induced habitat restoration and creation

Habitat management, hierarchy management, restoration, creation Habitat restoration techniques

Habitat creation techniques

Critical evaluation of restoration and creation techniques.

### LO3 **Evaluate appropriate species for habitat restoration and creation**

*Biotic and abiotic systems:*

Assessment of major components

Abiotic (soil, geology, topography, latitudinal light, temperature variation, climate and weather)

Biotic (intraspecific relationships, interspecific relations)

Choosing species - consideration of species provenance, matching species with site's abiotic and biotic features (population interactions).

### LO4 **Assess land use options for a range of habitat types.**

Management of semi-natural habitats:

Management methods post-restoration/creation - burning, cutting, grazing, chemical methods, Health and Safety considerations

Impacts of management and monitoring e.g. methods

Recording systems

Analysis of data and the importance of long-term management

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>L01</b> Explain the strategic importance of habitat restoration and repair.			<b>L01 L02</b> <b>D1</b> Evaluate the need and potential for restoration management.
<b>P1</b> Describe the variety of habitats present within a specified area.	<b>M1</b> Assess the degree of fragmentation of semi-natural habitats.		
<b>P2</b> Describe the role of human management in the establishment of semi-natural habitats.			
<b>L02</b> Evaluate the principles involved in the creation and restoration of habitats.			
<b>P3</b> Explain the role that ecological succession has within plagioclimax community maintenance.	<b>M2</b> Justify the need for human-induced restoration and creation techniques.		<b>D2</b> Evaluate individual species and population interactions with one another and with the abiotic environment.
<b>P4</b> Describe the difficulties associated with managing new habitats.			
<b>L03</b> Evaluate appropriate species for habitat restoration and creation.			
<b>P5</b> Undertake a pre-management survey of the main abiotic and biotic components of the site.	<b>M3</b> Justify appropriate species required for habitat restoration or creation.		<b>D3</b> Evaluate the potential impacts of a management technique on a given habitat.
<b>L04</b> Assess land use options for a range of habitat types.			
<b>P6</b> Implement the correct after-care management of a site (post-recreation/creation).	<b>M4</b> Discuss the need for long-term management in the maintenance of semi-natural habitats.		

## Recommended resources

### Textbooks

BLAKESLY, D. and BUCKLEY, P. (2016) *Grassland Conservation and Management*. Exeter: Pelagic Publishing.

LODWICK, L. (2013) *Creative Habitat Restoration: Comprehensive: Planning, Implementation and Long Term Management*. Bethlehem: Lehigh University Press.

RONI, P. (2012) *Stream and Watershed Restoration: A Guide to Restoring Riverine Processes and Habitats*. New Jersey: Wiley Blackwell.

SCHORDER, H.G. (2008) *Grasslands: Ecology, Management and Restoration*. New York: Nova Science Publishers.

WALKER, L.R, WALKER, J. and HOBBS, R. (2007) *Linking Restoration and Ecological Succession*. New York: Springer New York.

### Websites

www.cieem.net	Chartered Institute of Ecology and Environmental Management Homepage (General reference)
www.gov.uk	GOV.UK Natural England (General reference)
www.gov.uk	GOV.UK Habitat Restoration (General reference)
www.journals.elsevier.com	Elsevier Biological Conservation (Journal)
www.legislation.gov.uk	Legislation.GOV.UK Wildlife and Countryside Act 1981 (Legislative Act)
www.ser.org	Society for Ecological Restoration Homepage (General reference)

## **Links**

This unit links to the following related units:

*Unit 27: Environmental Management and Conservation*

## Unit 22: Plant and Crop Health (Diseases, Pests and Weeds)

<b>Unit code</b>	<b>Y/616/7977</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Maximising plant performance is a common goal of all those growing plants, whether it be the increase in yield obtained from the plant, the numbers of plants produced or the aesthetic qualities of the plant being grown. These are essential skills in the workplace and key decisions made will have significant impacts on the end product. This unit will focus on the biotic factors that may prevent the plant from reaching its full potential, namely weeds, pests and diseases.

This unit will focus upon the key groups of organisms that impact upon plant growth, understanding symptoms of plant problems, their biology and, most importantly, how their impact may be minimised. This will include an evaluation of different control methods to allow appropriate production decisions to be made for the specific situation.

The unit includes specific study on weed, pest and disease problems, helping to understand the implications of not managing their spread as well as the environmental impacts of pest and disease control. This includes the use of chemical and non-chemical control and management methods.

By completing the unit, students will develop skills needed to identify and diagnose problems correctly and use their knowledge to select appropriate management controls for their particular situation.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Describe the influence of common weed types on plant growth
2. Describe the life cycles of common pests and diseases of plants
3. Evaluate different approaches to pest, disease and weed control
4. Identify weeds, pests and diseases, their symptoms and select control methods to meet requirements.



## Essential content

### LO1 Describe the influence of common weed types on plant growth

#### *Weed biology:*

Classification by botanical classification with examples (monocotyledons, dicotyledons, bryophytes)

Classification by plant life cycle with examples (ephemeral, annual, perennial)

Classification by growth type with examples (herbaceous, woody, climbing).

#### *Impact on growth:*

Reduction in plant quality with examples (aesthetic, contamination of product)

Reduction in yield (competition for light, water, nutrients, space, host for pests and diseases)

Alternative hosts for pests and diseases

Reduction in efficiency (clogging machinery, additional resources used, impact on drainage systems, extensions to growth period).

### LO2 Describe the life cycles of common pests and diseases of plants

#### *Pests and their life cycles:*

Insects (beetles, caterpillars, flies, aphids, other hemiptera)

Mites

Molluscs (slugs, snails)

Birds

Mammals (rabbits, deer, rodents)

Nematodes

#### *Diseases and their life cycles:*

Virus

Bacteria

Fungi (soil borne, air borne, water borne).

*Factors affecting spread/infection:*

Climate and growing conditions

Vectors (sap sucking insects)

Nutrient status of the plant

Location of other plants

### **LO3 Evaluate different approaches to pest, disease and weed control**

*Weed control principles:*

Chemical controls with examples (pre-emergent, contact, translocated, selective, residual)

Biology of chemical weed control methods

Cultural weed control (mechanical methods, mulching).

*Pest and disease control principles:*

Pesticide use (contact, systemic, advantages and disadvantages for different plant problems)

Biological controls (predators, pathogens, pheromones)

Resistant varieties (traditional plant breeding methods, genetically modified organisms)

Non-chemical controls (cultural methods)

Crop monitoring methods

*Factors affecting the need to apply controls:*

Prediction/forecasting of infestation

Assessment of relative damage

Cost/benefit analysis.

*Environmental impacts of control methods:*

Pesticide-related legislation (control of substances hazardous to health, plant protection regulations, code of practice for using plant protection products, European biocide regulations)

Spray drift (non-target species, impact on food chains, resistance, bio-accumulation of toxic chemicals)

Leaching of pesticides

Non-native species (impact on local ecosystem, genetically modified organisms)

**LO4 Identify weeds, pests and diseases, their symptoms and select control methods to meet requirements.**

*Identification of weeds:*

Use of identification keys

Appearance in different stages of growth.

*Identification of pests, diseases and symptoms:*

Use of identification resources

Symptoms on commonly affected plants

*Selection of specific appropriate methods to meet production requirements:*

Requirements of the customer (permissible chemicals for crop, harvesting timing, quality specification, specific supply instructions)

Efficiency of control method (speed of control, relative effectiveness in control, cost of application).

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>LO1</b> Describe the influence of common weed types on plant growth		<b>D1</b> Critically evaluate the effectiveness of weed control in named crops.
<b>P1</b> Describe the life cycle of a range of common weeds. <b>P2</b> Describe the impacts weeds will have on plant growth.	<b>M1</b> Analyse the commercial impacts of weeds on named crops.	
<b>LO2</b> Describe the life cycles of common pests and diseases of plants.		<b>D2</b> Critically evaluate growing systems for named crops in relation to their risk of spreading pests or diseases.
<b>P3</b> Describe the life cycle of a range of common plant pests. <b>P4</b> Describe the life cycle of a range of common plant diseases.	<b>M2</b> Evaluate the factors that will impact the spread of named pests and diseases.	
<b>LO3</b> Evaluate different approaches to pest, disease and weed control		<b>D3</b> Critically evaluate the differing approaches to pest, disease and weed controls of different production systems.
<b>P5</b> Analyse the practical differences between chemical and non-chemical approaches to weed control. <b>P6</b> Analyse the practical differences between chemical and non-chemical approaches to pest and disease control.	<b>M3</b> Evaluate the impact of differing control approaches on the environment.	
<b>LO4</b> Identify weeds, pests and diseases, their symptoms and select control methods to meet requirements.		<b>D4</b> Provide a full justification of the recommended control methods suggested for the specified crops.
<b>P7</b> Examine a range of weeds in selected crops and suggest suitable control methods. <b>P8</b> Examine a range of plants affected by pests and diseases, identify the cause and select suitable control methods.	<b>M4</b> Critically evaluate the suitability of the suggested control methods against the customer's requirements.	

## Recommended resources

### Textbooks

BCPC (2017) *UK Pesticides Guide*. 30th edn. Wallingford: CABI.

BUCZACKI, S. and HARRIS, K. (2014) *Pests, Diseases and Disorders of Garden Plants*. 4th edn. London: Harper Collins.

COOK, D., FRASER, R. and WILBY, A. (2017) *Plant Biosecurity Policy Evaluation: The Economic Impacts of Pests and Diseases*. London: World Scientific.

MATTHEWS, G. (2015) *Pesticides: Health, Safety and the Environment*. New Jersey: Wiley-Blackwell.

VACANTE, V. (ed) (2017) *Handbook of Pest Management in Organic Farming*. London: CABI.

### Websites

www.csdhub.com	CS Design Software National Plant Specification (Details of hardy plant specifications)
www.gardenorganic.org.uk	Garden Organic Information from the UK's leading organic gardening charity (General reference)
www.hse.gov.uk	HSE Pesticide databases (Database)
www.soilassociation.org	Soil Association Details on organic certification schemes and current campaigns (General reference)
www.ukpesticideguide.co.uk	UK Pesticides Guide Online Whole of site (General reference)

## **Links**

This unit links to the following related units:

*Unit 6: Principles of Crop Production*

*Unit 4: Plant and Soil Science*

*Unit 8: Protective Crop Production*

*Unit 35: Sustainable Practices*

## Unit 23: Amenity and Sports Turf Construction and Establishment

<b>Unit code</b>	<b>T/616/8053</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Demands of turf today are many and varied, and expectations of high standards are placed upon the shoulders of those that are responsible for constructing and managing them. The aesthetic qualities of an area or the way it responds to play can be determined by the initial choices and construction methods selected.

This unit will cover the diverse range of turf surfaces used in amenity and sports turf sectors, both natural and artificial. It looks at their characteristics and construction, including site analysis, preparation and establishment.

Students will examine the characteristics of natural and artificial surfaces, compare and assess the impacts these have on intended use, and explore the complexity of natural and artificial surfaces in use within the industry.

Through completing this unit, students will develop their knowledge of the characteristics and construction of amenity and sports turf surfaces, and be able to investigate, evaluate and compare the values of natural and artificial surfaces.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Evaluate forms of natural and artificial turf surfaces
2. Describe construction specifications for natural turf
3. Describe construction specifications for artificial turf
4. Compare natural and synthetic turf surfaces.



## Essential content

### LO1 Evaluate forms of natural and artificial turf surfaces

#### *Uses:*

Domestic

Recreational

Sports (summer/winter)

Multi-use areas

Intended client usage

Nature of use

Level of use

Frequency

#### *Natural turf:*

Characteristics

Fine and coarse turf

Desirable grass species

Desirable grass mixtures for fine and coarse turf

#### *Artificial turf:*

Surface characteristics

Preferred characteristics

Non-filled systems

Sand-filled

Sand-dressed

Third generation e.g. sand and rubber infill, hybrid and woven

## LO2 **Describe construction specifications for natural turf**

### *Site analysis:*

Site evaluation

Suitability for intended use

Existing use of site

Location

Size

Boundaries

Soil type

Levels

Access

Services

### *Site clearance and preparation:*

Cultural and chemical methods

Topsoil conservation and management

Levelling and grading sub layers, equipment used, finished levels.

### *Drainage:*

Systems and design

Materials

Depths

Spacings and falls

Installation

Equipment used

Legislation

Environmental implications.

*Creation of rootzones:*

In situ

Primary and secondary cultivations

Amelioration materials

Imported rootzones

Grade, layers and suitability.

*Seeding and turfing for intended use:*

Species and cultivar mixes

Turf composition (species and rootzone material)

Surface levels and tilth

Equipment.

**LO3 Describe construction specifications for artificial turf**

*Site analysis:*

Site evaluation

Suitability for intended use

Existing use of site

Location

Size

Boundaries

Soil type

Levels

Access

Services

*Site clearance and preparation:*

Existing vegetation

Turf and topsoil removal

Re-use

Disposal

*Groundwork:*

Formation

Consistency

Stability

Levels

*Drainage:*

Systems and design

Materials

Depths

Spacings and falls

Installation

Equipment used

Legislation

Environmental implications

*Sub-base:*

Materials

Strength

Load transmission

Porosity

*Base materials:*

Depths

Use of membranes

Engineered or unbound

Shock pads

*Surface materials:*

Non-filled systems

Sand-filled

Sand dressed

Third generation (sand and rubber infill)

Materials and use characteristics.

#### LO4 **Compare natural and synthetic turf surfaces**

*Needs and demands of user:*

Amount of use

Type of use

Quality and standard of play.

*Costs:*

Construction costs

Maintenance costs

*Appearance and impact:*

Aesthetics

Health and Safety of users

Environmental impact

Potential maintenance and repair

End of life disposal

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>L01</b> Evaluate forms of natural and artificial turf surfaces.		<b>D1</b> Critically evaluate the properties of natural and artificial turf.
<b>P1</b> Discuss the types of natural and artificial turf surfaces.  <b>P2</b> Compare the characteristics of natural and artificial turf surfaces.	<b>M1</b> Evaluate the properties of natural and artificial turf.	
<b>L02</b> Describe construction specifications for natural turf.		<b>D2</b> Critically evaluate construction specifications for amenity and sports turf areas.
<b>P3</b> Describe construction specifications for natural turf surfaces.  <b>P4</b> Evaluate the use of species and cultivar mixes for amenity and sports turf areas.	<b>M2</b> Evaluate the advantages and disadvantages of using imported rootzones.	
<b>L03</b> Describe construction specifications for artificial turf.		<b>D3</b> Critically evaluate construction specifications for artificial amenity and sports turf areas.
<b>P5</b> Describe construction specifications for artificial turf surfaces.  <b>P6</b> Evaluate the advantages and disadvantages of using non-filled, sand-filled and third generation surfaces for recreation and sports turf areas.	<b>M3</b> Analyse the interaction between layers in an artificial sports turf surface.	
<b>L04</b> Compare natural and synthetic turf surfaces.		<b>D4</b> Critically evaluate the impact of natural and artificial surfaces on user satisfaction and quality of use.
<b>P7</b> Analyse the differences between natural and artificial turf surfaces.  <b>P8</b> Discuss the use of artificial turf in domestic and sports turf settings.	<b>M4</b> Evaluate the factors that would determine the choice of surface.	

## Recommended resources

### Textbooks

ADAMS, W.A. and GIBBS, R.J. (1993) *Natural Turf for Sport and Amenity*. London: CAB International.

BROWN, S. (2009) *Sports Ground Management*. Marlborough: The Crowood Press.

BROWN, S. (2005) *Sports Turf and Amenity Grassland Management*. Marlborough: The Crowood Press.

TURGEON, A.J. (2009) *Turfgrass Management*. 8th edn. Harlow: Pearson Education.

### Websites

www.bigga.org.uk	British and International Greenkeepers Association Whole site (General reference)
www.iog.org	Institute of Groundsmanship Whole site (General reference)
www.sportengland.org	Sport England Links to sports governing bodies (Research)
www.stri.co.uk	Sports Turf Research Institute Information from leading turf research establishment (Research)

### Links

This unit links to the following related units:

*Unit 24: Natural and Artificial Turf Care and Maintenance*

## Unit 24: Natural and Artificial Turf Care and Maintenance

<b>Unit code</b>	<b>A/616/8054</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Today's managers need to be technically skilled and knowledgeable to work with the resources available to maintain natural and artificial turf surfaces. Managers are working with a variety of surfaces with a diverse array of uses. How these areas are managed and maintained has a significant impact on the quality of surface and their continued use.

The purpose of this unit is to provide students with the knowledge and skills to determine the maintenance operations required, on natural and artificial turf surfaces, to meet the standards and expectations of today's turf user.

Students will investigate quality and performance standards for the maintenance of turf surfaces and examine the range of maintenance operations and equipment and materials used. The examination and assessment of surfaces will assist students in determining maintenance plans, future maintenance or actions for renovation.

Through completing this unit, students will develop their knowledge and skills at assessing surfaces against quality standards and use their knowledge to plan the maintenance needs of natural and artificial turf.



## **Learning Outcomes**

By the end of this unit students will be able to:

1. Discuss turf quality and performance standards
2. Describe the maintenance requirements of natural and artificial turf
3. Assess levels of surface quality
4. Describe the renovation and repair of natural and artificial turf surfaces.

## Essential content

### LO1 Discuss turf quality and performance standards

#### *Quality standards:*

Sward density

Ground cover

Desirable species

Colour

Appearance

Freedom from surface debris

Weeds

Pests

Diseases

Thatch

Moss

Surface water infiltration rate

Root penetration

Surface levels.

#### *Performance standards:*

Ball to surface

Speed

Trueness

Bounce/ball rebound

Player to surface traction

Resistance

Hold

Give

Abrasiveness.

*Governing body standards:*

Football

Rugby

Golf

Cricket

Hockey

Horse racing

Bowls.

## **LO2 Describe the maintenance requirements of natural and artificial turf**

*Maintenance operations – natural turf:*

Mowing

Aeration

Scarification

Brushing

Switching

Fertiliser application

Irrigation

Rolling

Weed control

Pest and disease control

Timing

Frequency

Heights

Depths

*Equipment:*

Hand-held

Pedestrian

Ride-on

Tractor mounted.

*Materials:*

Top-dressings  
Fertilisers  
Pesticides  
Bio-stimulants  
Wetting agents

*Standards:*

Timing  
Frequency  
Heights  
Depths

*Maintenance operations – artificial turf:*

Surface cleaning  
Infill distribution  
Maintaining surface levels  
Brushing  
Grooming  
Drag matting  
Weed control  
Moss and algae control  
Timing  
Frequency.

*Equipment:*

Hand-held  
Pedestrian  
Ride-on  
Tractor mounted.

*Materials:*

Infill dressings  
Pesticides  
Cleansing agents.

### LO3 **Assess levels of surface quality**

#### *Natural turf:*

Aesthetics

Presentation

Weeds

Pathogens

Disorders

Sward density

Colour

Species present

Response to user/player

Strength

Stability

Consistency

Permeability

#### *Artificial turf:*

Aesthetics

Presentation

Durability

Tensile strength

Movement

Traction

Friction

Response to user/player

Permeability

**LO4 Describe the renovation and repair of natural and artificial turf surfaces.**

*Sources of damage:*

Volume of use

Type of use

Weeds

Pathogens

Pests

Nematodes

Moss

Algae

Disorders

Quality and standard of play

*Assessment of damage:*

Forecasting

Recognition

Identification

Signs

Symptoms

*Methods of renovation and repair:*

Aeration

Scarification

Fraise mowing

Top-dressing

Patching

Plugging

Cultural controls

Chemical controls

Specialist equipment

*Factors affecting renovation and repair:*

Degree of damage

Cost

Cost-benefit

Health and Safety of users

Seasonality

Environmental conditions

Environmental impact

Legislation (pesticide, waste disposal, waste2water)

Timing and availability of resources

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>L01</b> Discuss turf quality and performance standards		<b>D1</b> Critically evaluate the impact of performance and quality standards on modern sports turf areas.
<b>P1</b> Discuss the standards applied to a range of turf surfaces.  <b>P2</b> Describe the role of sports governing bodies in setting standards for sports turf surfaces.	<b>M1</b> Evaluate the methods of assessing performance and quality standards on natural and artificial turf areas.	
<b>L02</b> Describe the maintenance requirements of natural and artificial turf.		<b>D2</b> Critically evaluate the interrelationship between maintenance operations and performance and quality standards.
<b>P3</b> Plan an annual maintenance programme for an amenity fine turf surface and an artificial sports turf surface.  <b>P4</b> Describe the operations required to maintain natural and artificial turf surfaces.	<b>M2</b> Evaluate the impact of maintenance operations on natural and artificial turf surfaces.	
<b>L03</b> Assess levels of surface quality.		<b>D3</b> Critically evaluate the advances in quality of artificial turf surfaces.
<b>P5</b> Describe those factors that impact upon the quality of a turf surface.  <b>P6</b> Assess the quality of a natural sports turf surface.	<b>M3</b> Evaluate the quality of a given turf surface using performance quality standards.	
<b>L04</b> Describe the renovation and repair of natural and artificial turf surfaces.		<b>D4</b> Critically evaluate the impact of renovation operations on a given natural sports turf surface.
<b>P7</b> Describe the operations required to renovate and repair natural and artificial turf surfaces.  <b>P8</b> Plan a programme of renovation for a given natural and artificial turf surface.	<b>M4</b> Evaluate the factors that would determine the extent of renovation operations required.	



## Recommended resources

### Textbooks

- ADAMS, W.A. and GIBBS, R.J. (1993) *Natural Turf for Sport and Amenity*. London: CAB International.
- BROWN, S. (2009) *Sports Ground Management*. Marlborough: The Crowood Press.
- BROWN, S. (2005) *Sports Turf and Amenity Grassland Management*. Marlborough: The Crowood Press.
- TURGEON, A.J. (2009) *Turfgrass Management*. 8th edn. Harlow: Pearson Education.

### Websites

<a href="http://www.bigga.org.uk">www.bigga.org.uk</a>	British and International Greenkeepers Association  Whole site  (General reference)
<a href="http://www.iog.org">www.iog.org</a>	Institute of Groundsmanship  Whole site  (General reference)
<a href="http://www.secure.pesticides.gov.uk">www.secure.pesticides.gov.uk</a>	Health and Safety Executive  Listing of approved Plant Protection Products  (Research/General reference)
<a href="http://www.stri.co.uk">www.stri.co.uk</a>	Sports Turf Research Institute  Information from leading turf research establishment  (Research)

### Links

This unit links to the following related units:

*Unit 23: Amenity and Sports Turf Construction and Establishment*

## Unit 25: Tree Care and Arboricultural Management

<b>Unit code</b>	<b>F/616/8055</b>
<b>Unit type</b>	<b>Optional</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Trees deliver a range of tangible social, environmental, biodiversity and economic benefits to our lives. In both urban and rural settings, trees enhance landscapes, provide important habitats for a wide range of species, provide ecosystem services and contribute to the economic wellbeing of communities.

This unit is designed to provide students with an understanding of how high quality care and arboricultural management can help realise these benefits. Research-informed best practice is emphasised throughout the unit as the management of young and mature trees in both urban and rural settings is researched.

Students will develop their understanding of the criteria for tree establishment, skills in tree surveying and assessment, and experience of recommending management interventions to meet specific arboricultural needs.

On completion of the unit, students will have a thorough understanding of the role and contribution that trees make to urban and rural landscapes. The unit has a strong vocational element throughout and students will gain confidence in tree assessment methodologies and management interventions.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Assess the social, environmental and economic value of trees
2. Evaluate the process of tree establishment
3. Survey trees for a specific purpose
4. Evaluate the practical management of trees.

## Essential content

### LO1 **Assess the social, environmental and economic value of trees**

*Environmental, social and economic benefits of trees:*

Trees as habitats

Moderation of local climate by trees

Value of trees in reducing urban flooding and sustainable urban drainage systems (SUDS)

Trees and air quality

The evidence base for the environmental benefits of trees

Aesthetic value of trees

Psychological benefits of trees

Community projects involving trees

Trees, green infrastructure and public health

Evidence base for the social benefits of trees

Methods for establishing the benefits of trees, quantitative and qualitative research methods

Tree and landscape modelling software, use of GIS

Direct employment in tree management

Products from trees

Enhanced landscape character and increased property prices in relation to trees

Link between quality landscape character and inward investment Reduced energy bills

Prevention of flooding

The evidence base for the economic benefits of trees

## LO2 **Evaluate the process of tree establishment**

### *Tree selection criteria:*

Species selection for urban trees e.g. application of ecophysiology in tree species selection, ensuring high quality tree stock and tree specification, bare root, containerised and root balled trees, tree handling prior to planting

Tree rooting environment e.g. assessment of soil conditions, linking available soil volume to potential mature tree size, enhancing soil volume, promoting soil ecology

Tree planting and aftercare e.g. best practice in planting, urban tree pits, staking and guying, tree protection, aftercare and maintenance (mulching, irrigation, formative pruning), reducing conflict with urban infrastructure, establishment problems caused by poor planting practice, research-informed practice

## LO3 **Survey trees for a specific purpose**

### *Collecting and recording tree data:*

Selection and recording tree data to meet required outcomes (species, height, girth, canopy spread, location, proximity to infrastructure)

Measurement of trees

Survey criteria informed by British Standards (BS5837)

Standard tree survey equipment

Recording tree data

Use of Geographical Information Systems (GIS)

### *Assessment of tree condition:*

Visual Tree Analysis (VTA)

Biological factors associated with tree hazards

Biomechanical factors associated with tree hazards

Targets

Hazard rating systems

Chlorophyll fluorescence as an aid to tree assessment.

*Using tree data to inform tree management strategies and recommendations:*

The value of tree inventories

Strategic management of tree populations in the built environment

Managing hazardous trees

Use of tree data to assess the contribution of tree populations to local ecosystem services

Justification of tree management recommendations using tree data.

#### **LO4 Evaluate the practical management of trees.**

*The legal framework for arboricultural operations:*

Health and Safety legislation and best practice in relation to tree work

Statutory protection of trees (tree preservation orders and conservation areas)

Environmental and habitat protection legislation and their impact on arboricultural operations (Wildlife and Countryside Act 1981, Countryside and Rights of Way Act 2000)

*Standards for tree work:*

British Standard 3998: 2010 Tree Work Recommendations

British Standard 5837:2012 Trees in relation to design, demolition and construction-recommendations

*Canopy maintenance:*

Equipment for canopy maintenance e.g. canopy access and tree climbing techniques

Pruning (natural target pruning, crown reductions, crown thinning, deadwood management)

Support systems (bracing, guying propping)

Significance of poor practice (topping trees, flush cuts, stub cuts)

Managing trees for habitat

Research-informed practice

*Managing the rooting environment:*

Mulching

Tree nutrition and fertilisation

Managing soil compaction

Specialist equipment for soil injection and soil decompaction

Soil water relations

Tree irrigation

Research-informed practice

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>L01</b> Assess the social, environmental and economic value of trees		<b>L01 L02</b>  <b>D1</b> Critically evaluate best practice in urban tree establishment.
<b>P1</b> Analyse the environmental benefits of trees.  <b>P2</b> Analyse the social benefits of trees.  <b>P3</b> Analyse the economic value of trees.	<b>M1</b> Critically analyse the methods which may be used to assess the benefits of trees.	
<b>L02</b> Evaluate the process of tree establishment.		
<b>P4</b> Evaluate management approaches which would enhance the rooting environment for young trees.  <b>P5</b> Evaluate a selection of tree species and stock type suitable for a range of conditions found in built environments.	<b>M2</b> Evaluate the tree rooting environment for a specified location.	
<b>L03</b> Survey trees for a specific purpose.		<b>D2</b> Produce a detailed assessment of tree condition at a given location.
<b>P6</b> Collect and record data relating to trees in a given location.  <b>P7</b> Use tree data from a given location to support management decisions.	<b>M3</b> Evaluate the use of tree survey equipment.	
<b>L04</b> Evaluate the practical management of trees.		<b>D3</b> Critically examine how research has informed best practice in arboriculture.
<b>P8</b> Analyse the legal framework for arboricultural operations.  <b>P9</b> Explain the applications of British standards to tree management scenarios.	<b>M4</b> Recommend canopy and root management operations to specified trees in a built environment.	



## Recommended resources

### Textbooks

HARRIS, R. (2003) *Arboriculture: Care of Trees, Shrubs and Vines in the Landscape*. New Jersey: Prentice-Hall.

INTERNATIONAL SOCIETY OF ARBORICULTURE. (2010) *Arboriculture, Vol. 1 & 2*. London: Forgotten Books.

JEPSON, J. (2000) *Tree Climber's Companion: A Reference and Training Manual for Professional Tree Climbers*. London: Johnston.

JOHNSON, O. (2006) *Collins Tree Guide*. Glasgow: Collins.

JOHNSTON, M. (2015) *Trees in Towns and Cities: A History of British Urban Arboriculture*. Oxford: Windgather Press.

JONES, N.D.G. (1990) *The Arboriculturalist's Companion: A Guide to the Care of Trees*. New Jersey: Wiley-Blackwell.

LARCHER, W. (2003) *Physiological Plant Ecology: Ecophysiology and Stress Physiology of Functional*. London: Springer Publishing.

NAFEES, A.K, and AGARWAL, R.M. (2011) *Plant Ecophysiology*. New Delhi: I.K International Publishing.

WATSON, B. (2013) *Trees: Their Use, Management, Cultivation and Biology – A Comprehensive Guide*. Marlborough: Crowood Press Ltd.

### Websites

[www.eden.gov.uk](http://www.eden.gov.uk)

Eden District Council

Tress in relation to design, demolition and construction – Recommendations British Standard 5837:2012

(General reference)

[www.isa-arbor.com](http://www.isa-arbor.com)

International Society of Arboriculture

Homepage

(General reference)

[www.trees.org.uk](http://www.trees.org.uk)

Arboricultural Association

A Brief Guide to Tree Work Terminology and Definitions (Article)

www.tandfonline.com

Taylor & Francis Online

Arboricultural Journal: The International  
Journal of Urban Forestry

(General reference)

## **Links**

This unit links to the following related units:

*Unit 26: Woodland Management*

*Unit 27: Environmental Management and Conservation*

## Unit 26: Woodland Management

<b>Unit code</b>	<b>H/616/7982</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Good woodland management has multiple benefits. It can provide additional income to a business, maximise wildlife benefit and enhance the landscape. Whether creating new areas of woodland or managing existing woods, to achieve optimum results it is essential to correctly apply the appropriate principles and practices. It is not economically viable to contract out the management of small areas of woodland so developing the skills to look after woodland alongside other business activities will be a great advantage.

The purpose of this unit is to develop the skills and knowledge to make both appropriate management decisions and to be able to undertake the hands-on work.

This unit will cover woodland establishment management and harvesting, and explore uses of woodland and wood products. Students will develop the theoretical and practical management skills, learning how to select appropriate species for stocking, the management cycle, how to assess woodland conditions and when to make interventions.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Assess the methods of and conditions for establishing woodlands
2. Evaluate woodland management options and select those appropriate to achieving objectives
3. Apply industry standard techniques to assess woodland condition and quality
4. Identify markets and uses for woodlands and woodland products.

## Essential content

### LO1 **Assess the methods of and conditions for establishing woodlands**

*Methods and conditions:*

Select species based on soil type, location and objectives

Consider native/non-native species for stocking

Decide on establishment techniques (planting or natural regeneration)

Consider site preparation based on conditions, selected establishment method and resources

Identify protection methods for newly established woodlands appropriate to scale of site and threat

### LO2 **Evaluate woodland management options and select those appropriate to achieving objectives**

Management options:

Consider the condition of the woodland if already established and the desired objectives of management

Conifer management/broadleaf management

Priorities e.g. commercial timber, conservation, recreation

Stage of growth cycle/quality

Markets for thinnings/end point markets

Coppice or standards

Management constraints (site size, location, aspect, designations)

Cost/benefit

Harvesting options

**LO3 Apply industry standard techniques to assess woodland condition and quality**

*Assessment techniques:*

Visual assessment

Qualitative and quantitative methods

Surveys used of forest mensuration methodologies

Use of measurement equipment (girthing tapes, clinometers, software)

**LO4 Identify markets and uses for woodlands and woodland products.**

*Markets and uses:*

Markets for different products (thinnings, final crop, coppice products)

Construction timber, pulp, fire wood, veneer

On-site processing, off-site sales

Additional uses of woodland sites (recreation activities, sporting activities, education activities, burials)

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>LO1</b> Assess the methods of and conditions for establishing woodlands.		<b>LO1 LO2</b> <b>D1</b> Critically evaluate woodland management proposals in line with feasibility and good practice.
<b>P1</b> Produce a site appraisal.	<b>M1</b> Evaluate cost/benefits of proposals.	
<b>P2</b> Identify suitable species and establishment methods.		
<b>P3</b> Plan preparation methods to suit site.		
<b>LO2</b> Evaluate woodland management options and select those appropriate to achieving objectives.		
<b>P4</b> Produce a comparison of management options for a given area.	<b>M2</b> Justify the preferred management option.	
<b>LO3</b> Apply industry standard techniques to assess woodland condition and quality.		
<b>P5</b> Undertake an assessment of a given woodland.	<b>M3</b> Evaluate the pros and cons of alternative assessment methods.	
<b>LO4</b> Identify markets and uses for woodlands and woodland products.		<b>LO3 LO4</b> <b>D2</b> Critically evaluate the feasibility of achieving optimum return on the given woodland.
<b>P6</b> Produce a marketing plan which optimises the use of a given woodland and its products.	<b>M4</b> Analyse alternative uses and markets.	

## Recommended resources

### Textbooks

BLAKSLEY, D. and BUCKLEY, P.G. (2010) *Managing Your Woodlands For Wildlife*. Newbury: Pisces Publications.

EVANS, J. and ROLLS, W. (2015) *Getting Started in Your Own Wood*. Petersfield: Permanent Publications.

FORESTRY COMMISSION (2017) *The UK Forestry Standard: The Government's Approach to Sustainable Forestry*. Edinburgh: Forestry Commission.

HARMER, R. and HOWE, J. (2003) *Silviculture and Management of Coppice Woodlands*. Edinburgh: Forestry Commission.

KERR, R., HARMER, G. and THOMPSON, R.W. (2004) *Managing Native Broadleaved Woodland*. Edinburgh: Forestry Commission.

MATTHEWS, R.W. and MACKIE, E.D. (2013) *Forest Mensuration*. 2nd edn. Edinburgh: Forestry Commission.

SAVILL, P. (2013) *The Silviculture of Trees*. 2nd edn. Wallingford: CABI.

STARR, C. (2013) *Woodland Management – A Practical Guide*. Marlborough: The Crowood Press.

### Links

This unit links to the following related units:

*Unit 25: Tree Care and Arboricultural Management*

*Unit 27: Environmental Management and Conservation*



## Unit 27: Environmental Management and Conservation

<b>Unit code</b>	<b>D/616/7981</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

It is no longer acceptable or desirable to solely focus on production without considering environmental management and conservation. There are a number of reasons for this. Firstly, environmental legislation makes it a legal requirement and in many cases this is backed up by being a requisite to accessing support funds where available. The environment provides ecosystem services such as pollination and natural pest control. It therefore makes common sense to effectively manage the environment to maximise these. In addition, as a result of intensive production practices, many once common species are becoming rare, and rare species are being driven to extinction. We have a responsibility to play our part in reversing this trend.

This module will develop the skills required to assess the status of habitats on holdings and then develop management plans which take into consideration constraints of land use and legal requirements. The unit will also develop appropriate monitoring and evaluation methodologies to allow the impact of management practices and conservation activities to be assessed for both positive and negative impacts on habitats.

Habitat assessments will be undertaken, drawing on base-line data and practical on-site surveys. The surveys will be appropriate to the scale and importance of the site and resources available. Drawing on examples from well-managed sites, management plans will be developed to maintain or improve site conditions as appropriate. Different monitoring and evaluation methodologies will be evaluated and impact reports produced.

By the end of the unit students will be able to accurately assess the condition of ecologically significant sites on holdings. They will be able to produce management plans which will be effective and meet legal requirements and monitor and evaluate the impact of management prescriptions on habitats.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Assess the status of habitats on holdings
2. Produce plans to maintain or improve their condition
3. Monitor the impact of conservation actions
4. Evaluate environmental management practice.

## Essential content

### LO1 Assess the status of habitats on holdings

#### *Assess habitats:*

Using key species records, identify if they are still present on-site and make an estimate of numbers

Assess whether species are healthy and thriving or under pressure

From records, evaluate loss of conservation areas to production

### LO2 Produce plans to maintain or improve their condition

#### *Develop plans to conserve and prevent decline:*

Drawing on examples from local areas, develop plans to conserve and prevent decline in the quality of conservation areas

Incorporate the principles of integrated land management in plan development

Positive non-intervention is an option.

### LO3 Monitor the impact of conservation actions

#### *Undertake impact monitoring:*

Needs to be appropriate to the scale of individual sites

Suitable to identify if objectives are being met

Feasible within resource constraints

The methodology needs to be clearly recorded, capable of replication and preferably compatible with any previous site monitoring results

### LO4 Evaluate environmental management practice.

#### *Undertake the evaluation of environmental management plans:*

Management practices need to be evaluated from both the perspective of pure conservation and the impact of husbandry practices on environmental conservation

Environmental management practices need to be species and habitat specific, and appropriate to the scale of the site

They need to consider any site or species' protected status and current legislation.

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
LO1 Assess the status of habitats on holdings		LO1 LO2  D1 Critically evaluate environmental management plans and their impact on site management.
P1 Produce a species survey of two sites, including any locally significant species, and compare the results to similar local sites to produce a basic assessment.	M1 Interpret the significance of the assessment in relation to local biodiversity action plans.	
LO2 Produce plans to maintain or improve their condition		
P2 Produce management plans for the areas surveyed.	M2 With reference to other local sites, evaluate the proposed management prescriptions.	
LO3 Evaluate environmental management practices		LO3 LO4  D2 Discuss how own management plans contribute to improving the wider environmental condition.
P3 Drawing on given case studies, produce a report identifying three environmental management practices which could be applied to chosen sites.	M3 Define the predicted impacts of the management practices.	
LO4 Evaluate environmental management practice.		
P4 Plan a monitoring programme for selected sites.	M4 Evaluate own programmes and discuss alternative methodologies which could have been applied.	

## Recommended resources

### Textbooks

AUSDEN, M. (2007) *Habitat Management for Conservation: A Handbook of Techniques (Techniques in Ecology and Conservation)*. Oxford: Oxford University Press.

DICKS, L.V., ASHPOLE, J.E., DÄNHARDT, J., JAMES, K., JÖNSSON, A., RANDALL, N., SHOWLER, D.A., SMITH, R.K., TURPIE, S., WILLIAMS, D. and SUTHERLAND, W.J. (2013) *Farmland Conservation: Evidence for the Effects of Interventions in Northern and Western Europe*. London: Pelagic Publishing.

MACDONALD, D.W. and FEBER, R.E. (2015) *Wildlife Conservation on Farmland Volume 1*. Oxford: Oxford University Press.

MACDONALD, D.W. and FEBER, R.E. (2015) *Wildlife Conservation on Farmland Volume 2*. Oxford: Oxford University Press.

SUTHERLAND, W.J. and HILL, D.A. (1995) *Managing Habitats for Conservation*. Cambridge: Cambridge University Press.

### Websites

[www.banc.org.uk](http://www.banc.org.uk)

British Association of Nature  
Conservation

ECOS journal  
(Research)

### Links

This unit links to the following related units:

*Unit 26: Woodland Management*

*Unit 35: Sustainable Practices*

## Unit 28: Plant Physiology and Environmental Adaptation

<b>Unit code</b>	<b>J/616/8056</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Plants have evolved over hundreds of millions of years through evolution. By adapting to different environments, they are able to colonise much of the planet, including oceans, deserts and tundra. For several millennia, this adaptation has been assisted by human intervention through breeding and the selection of superior strains of crop plants.

This unit provides students with the ability to relate the adaptation of plants to different and often changing environments, both natural and adapted by humans in protected cropping and urban agriculture. It investigates vital plant processes such as the uptake of water into the plant by the process of osmosis, the manufacture of glucose in leaves and stems by the process of photosynthesis. The morphological modification of roots, leaves and stems such as tendrils, spines, stolon's, rhizomes and corms will also be explored. Physiological adaptations to dry (xerophytic), salt water (halophytic) and aquatic (hydrophytic) environments will be investigated.

Technological advancements in modifying crop environments are being used more and more to increase yields and make crop production economically viable in urban environments such as disused factory buildings and underground railway tunnels. New energy-efficient lighting systems have reduced the cost of providing photosynthetically active radiation for situations where there is no natural light.

Soil-less growing systems (hydroponics) create opportunities to optimise cropping in protected environments and the unit will explore the suitability of different media for supporting strong and healthy root growth. Many modern crop plants differ substantially from their wild ancestors, for example *Beta vulgaris* has been developed into crop plants as diverse as sugar beet, fodder beet and Swiss chard. The physiological development of crop plants from their wild ancestors will be investigated in this unit.

At the end of this unit students will be able to explain how plants adapt to different environmental regimes and how knowledge of these adaptations is used to breed and cultivate plants in both field and protected cropping environments.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Explain the relationship between plant anatomy and physiological processes
2. Identify and explain the purpose of plant adaptations to different environments with reference to named examples
3. Discuss the application of environmental adaptations that are used in crop production to optimise plant growth and cropping
4. Discuss the development of the physiology of crop plants from their wild ancestors to the present.



## Essential content

### LO1 **Explain the relationship between plant anatomy and physiological processes**

#### *Root structure and function:*

Water and nutrient uptake

Anchorage

Root tissues and cell types

Cultural activities that optimise or inhibit root functions in soil or growth media

#### *Stem structure:*

Cell types and cellular arrangements

The function of the different cell types in relation to the prime functions of water and mineral transportation and support

Cultural practices that affect stem growth

#### *Leaf structure:*

Cellular arrangements and leaf tissues and how these facilitate photosynthesis

### LO2 **Identify and explain the purpose of plant adaptations to different environments with reference to named examples**

#### *Xerophytic and halophytic:*

Root, stem and leaf adaptations

Modified pathways for carbon dioxide uptake and photosynthesis

Hydrophytic e.g. modified stem, root and leaf structure

Modified carbon dioxide uptake and oxygen movement

**LO3 Discuss the application of environmental adaptations that are used in crop production to optimise plant growth and cropping**

*Supplementary lighting* – wavelength, intensity duration

*Photoperiod* – duration, effect on flowering and morphology

*Carbon dioxide enrichment* – concentration and cost effectiveness of use

*Optimising photosynthesis*

*Hydroponics*-different substrates e.g. sustainability and durability, nutrient application

**LO4 Discuss the development of the physiology of crop plants from their wild ancestors to the present**

Suitable species *Beta vulgaris* and *Brassica oleracea* or other cultivated species that have been developed substantially from wild ancestors

Response to temperature

Response to day length

Response to rainfall and irrigation

Response to extreme weather

Response to different levels of salinity

Response to soil nutrition

Adaptation to mechanised harvesting

Crop uniformity

Increased yield

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>L01</b> Explain the relationship between plant anatomy and physiological processes.			<b>D1</b> Evaluate how knowledge of plant physiology and environmental responses has developed cultural technology in either horticulture or agriculture.
<b>P1</b> Explain how typical plant structure facilitates key physiological processes using annotated diagrams.		<b>M1</b> Analyse how the physiology of plants varies according to their role within a defined plant community.	
<b>P2</b> Describe the key differences between monocotyledons and dicotyledons in terms of structure, relating these differences to key physiological processes.			
<b>L02</b> Identify and explain the purpose of plant adaptations to different environments with reference to named examples.			<b>D2</b> Critically evaluate how knowledge of plant adaptation to different environments can be used to build resilience for crops growing in marginal land or affected by environmental change.
<b>P3</b> Describe how plants are able to adapt to xerophytic and halophytic environments.		<b>M2</b> Investigate the culture of a hydrophytic, xerophytic or halophytic crop plant.	
<b>P4</b> Describe how plants are able to adapt to hydrophytic environments.			
<b>L03</b> Discuss the application of environmental adaptations that are used in crop production to optimise plant growth and cropping.			<b>D3</b> Critically evaluate environmental adaptations in commercial urban crop production that utilises intensive cultivation techniques in an indoor or underground environment.
<b>P5</b> Discuss the use of supplementary lighting and day length lighting with reference to a specific crop plant.		<b>M3</b> Evaluate the economic benefits of supplementary lighting and carbon dioxide enrichment, comparing the advantages and disadvantages of different systems.	
<b>P6</b> Explain different substrate material for use in hydroponics in terms of performance and sustainability.			

Pass	Merit	Distinction
<b>L04</b> Discuss the development of the physiology of crop plants from their wild ancestors to the present.		<b>D4</b> Investigate a current research project which aims to develop resilience or other attributes in a crop in response to environmental change.
<b>P7</b> Describe the development of three distinct cropping plants from a wild ancestor.  <b>P8</b> Explain how cropping plants are modified by reference to three specific examples.	<b>M4</b> Evaluate the development of several crop plants from a single wild ancestor.	

## Recommended resources

### Textbooks

BARBER, J. and INSTITUTION OF CIVIL ENGINEERS (2002) *Health & Safety in Construction: Guidance for Construction Professionals*. London: Thomas Telford.

BECK, C. (2010) *An Introduction to Plant Structure and Development*. Cambridge: Cambridge University Press.

BELL, D. (2008) *An Illustrated Guide to flowering Plant Morphology*. Newton Abbot: Timber Press.

SOLTANI, A. (2012) *Modelling Physiology of Crop Development, Growth and Yield*. London: CBI publishing.

TALZ, L. and ZEIGER, E. (2014) *Plant Physiology and Development*. Sunderland MA: Sinauer.

### Websites

<a href="http://www.bsbi.org">www.bsbi.org</a>	Botanical Society of Great Britain and Ireland Homepage (General reference)
<a href="http://www.key.org">www.key.org</a>	Kew Gardens Science (General reference)
<a href="http://www.plantphysiol.org">www.plantphysiol.org</a>	Plant Physiology Homepage (General reference)
<a href="http://www.sciencedirect.com">www.sciencedirect.com</a>	Science Direct Journal of Plant Physiology (Journal)
<a href="http://www.journals.elsevier.com">www.journals.elsevier.com</a>	Elsevier Plant Physiology and Biochemistry (Journal)

## **Links**

This unit links to the following related units:

*Unit 1: Principles of Botany*

*Unit 6: Principles of Crop Production*

*Unit 7: Plant and Crop Nutrition*

*Unit 29: Plant Breeding and Genetics*

## Unit 29: Plant Breeding and Genetics

<b>Unit code</b>	<b>D/616/7978</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

The aim of this unit is to provide students with an appreciation and understanding of the complex world of genetics and plant breeding. This is a rapidly developing sector and needs to keep up with the demand for increased food production to meet the demands of the world population in a sustainable way. Historically, the Land-based sector has made great strides in the development of improved plant strains which provide superior yields and other benefits, but the demand is for even greater improvements.

Building on other plant science units, this unit focusses upon the management and mapping of genetic information as well as the practical application of traditional and modern techniques to meet future needs. The development of new varieties and cultivars will increase in pace as time progresses and the demands for reliable, disease-resistant plants becomes greater.

This unit is underpinned by theoretical knowledge but allows students to develop their practical skills, not only in the laboratory but also in the field.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Describe the development of crop species and common cultivated plants
2. Explain the genetics of plant improvement
3. Describe the methods of plant reproduction and hybrid development
4. Evaluate the commercial processes used for a range of cultivated plants.



## Essential content

### LO1 Describe the development of crop species and common cultivated plants

#### *History of crop development:*

Original locations of significant plant species

Comparisons of wild types with cultivated forms (size, appearance, yield)

Loss of genetic variation

#### *History of genetic theory:*

Theories of Camerarius, Kölreuter, Darwin, Mendel and their impact

Developmental work of G.H. Scull, B. McClintock

### LO2 Explain the genetics of plant improvement

#### *Genetic information:*

Deoxyribonucleic acid

Ribonucleic acid

Chromosomes

Genes

Alleles

#### *Protein synthesis:*

Transcription and translation

#### *Gene interactions:*

Incomplete dominance

Lethal alleles

Co-dominance

Multiple alleles

Epistasis

#### *Meiosis and mitosis:*

Each stage of division for somatic cells and gametes

*Reasons for genetic variance in a population:*

Meiotic changes (homologous recombination, polyploidy, mutation)

Changes in population (immigration, translocation, selection)

### **LO3 Describe the methods of plant reproduction and hybrid development**

*Methods to ensure fertilisation:*

Barriers to self-pollination (physical, timescale, genetic, biochemical)

*Stimulation of plants to flower:*

Use of hormones

Adaptation of light levels

Vernalisation

*Selection of appropriate plant material:*

Criteria for selection (yield, colour, disease resistance, size etc.)

Methods of scoring plant quality

Creating genetic uniformity in parents

*Prediction of results of a cross:*

Monohybrid and di-hybrid crosses using probability tables (Punnett squares)

Production of F<sub>1</sub> hybrids

*Creation of mutations and variance:*

Induced mutagens e.g. irradiation, chemicals

Inserted mutagens e.g. DNA

Risks and opportunities of mutagenic techniques

#### LO4 **Evaluate the commercial processes used for a range of cultivated plants**

*Methods used for the breeding:*

Wind-pollinated plants

Open-pollinated plants

F<sub>1</sub> hybrids

Ornamental plants

Food crops

*Physical resources needed to enable plant breeding:*

Buildings/growing facilities

Vectors/equipment for pollination

Equipment to prevent unintended pollination

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>L01</b> Describe the development of crop species and common cultivated plants.		<b>D1</b> Evaluate the impacts of plant breeding on the development of plants.
<b>P1</b> Describe the development of cultivated plants through history. <b>P2</b> Describe the development of genetic theory.	<b>M1</b> Analyse the impact of plant breeding on crop yield.	
<b>L02</b> Explain the genetics of plant improvement.		<b>D2</b> Critically evaluate the impact of gene interactions on the production of new plant cultivars.
<b>P3</b> Compare the properties of DNA and RNA with specific emphasis on their roles in protein synthesis. <b>P4</b> Discuss the role of meiotic and mitotic cell division in the development of offspring.	<b>M2</b> Investigate the impacts of the following gene interactions with specific emphasis on phenotypic traits: <ul style="list-style-type: none"><li>• Lethal alleles</li><li>• Epistasis</li><li>• Incomplete dominance</li><li>• Co-dominance</li><li>• Multiple alleles.</li></ul>	
<b>L03</b> Describe the methods of plant reproduction and hybrid development.		<b>D3</b> Evaluate the impact of current plant breeding techniques on the availability and effectiveness of plant introductions.
<b>P5</b> Describe techniques used to ensure controlled pollination of plants. <b>P6</b> Review the use of probability tools when predicting the outcome of specific crosses. <b>P7</b> Identify techniques that produce mutations in plants.	<b>M3</b> Critically analyse the effectiveness of current plant breeding techniques.	
<b>L04</b> Evaluate the commercial processes used for a range of cultivated plants.		<b>D4</b> Critically evaluate the development and performance of a new commercial plant cultivar.
<b>P8</b> Describe processes used to produce a range of new plant cultivars.	<b>M4</b> Analyse the development of selected new plant cultivars.	

## Recommended resources

### Textbooks

ACQUAHH, G. (2012) *Principles of Plant Genetics and Breeding*. 2nd edn. Oxford: Wiley-Blackwell.

BARBER, J. and INSTITUTION OF CIVIL ENGINEERS (2002) *Health & Safety in Construction: Guidance for Construction Professionals*. London: Thomas Telford.

BERNARDO, R. (2014) *Essentials of Plant Breeding*. Minnesota: Stemma Press.

BRADSHAW, J.E. (2016) *Plant Breeding: Past, Present and Future*. London: Springer.

BROWN, J., CALIGARI, P. and CAMPOS, H. (2014) *Plant Breeding*. 2nd edn. Oxford: Wiley-Blackwell.

MACADAM, J.W. (2009) *Structure and Function of Plants*. Oxford: Wiley-Blackwell.

### Websites

[www.escijournals.net](http://www.escijournals.net)

ESCI Journals Publishing

Journal of Plant Breeding and  
Genetics

(Journal)

### Links

This unit links to the following related units:

*Unit 4: Plant and Soil Science*

## Unit 30: Business Strategy

<b>Unit code</b>	<b>T/616/7985</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

The aim of this unit is to develop students' awareness of the different kinds of strategy which could be used in an operational, tactical or strategic role for a Land-based organisation. This will be underpinned by a thorough knowledge and understanding of the theories, models and concepts which could significantly support a Land-based organisation's strategic choice and direction.

On successful completion of this unit students will have developed sufficient knowledge and understanding of strategy to make a positive, efficient and effective contribution to the development of business plans and operational direction. This could be in the role of a junior manager responsible for having a specific input into a Land-based organisation's decision-making and planning.

## **Learning Outcomes**

By the end of this unit a student will be able to:

1. Analyse the impact and influence which the macro environment has on a Land-based organisation and its business strategies
2. Assess a Land-based organisation's internal environment and capabilities
3. Evaluate and apply the outcomes of an analysis using Porter's Five Forces model to a given market sector
4. Apply models, theories and concepts to assist with the understanding and interpretation of strategic directions available to a Land-based organisation.

## Essential Content

### LO1 **Analyse the impact and influence which the macro environment has on a Land-based organisation and its business strategies**

#### *The strategic context:*

Missions, visions and objectives

The definition and meaning of strategy

The role of strategy to achieve business objectives and goals, strategic intent and different strategic direction

Different strategic planning techniques

#### *Analytical frameworks of the macro environment:*

The different types of frameworks and analysis of the macro environment

Stakeholder analysis e.g. stakeholder matrix, stakeholder mapping

Environmental analysis e.g. PESTLE and Porter's Five Forces model

Structure-conduct-performance model

Strategic positioning e.g. Ansoff's growth vector matrix

Organisational audit e.g. SWOT analysis, benchmarking indicators

### LO2 **Assess a Land-based organisation's internal environment and capabilities**

#### *Organisational internal environment:*

What are strategic capabilities and what are the key components of strategic capabilities?

Resource-based view strategy as a basis for competitive advantage and the McKinsey's 7S model as a management tool

Analysis of strategic capabilities using the VRIO/VRIN framework

Benchmarking strategic capabilities and value chain analysis

Cost-benefit analysis



**LO3 Evaluate and apply the outcomes of an analysis using Porter's Five Forces model to a given market sector**

*Analytical tools and models of analysis:*

The Balanced Scorecard to align organisation vision and strategy

Competitive analysis using Porter's Five Forces model

Stakeholder analysis

Applying the Ansoff matrix to product/market strategy

**LO4 Apply models, theories and concepts to assist with the understanding and interpretation of strategic directions available to a Land-based organisation**

*Strategic choices and directions:*

The application of Porter's generic strategies e.g. cost and price leadership strategy, differentiation strategy, focus strategy and the extended model of Bowman's strategy clock

Hybrid strategy

Diversification

Vertical/horizontal integration

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>L01</b> Analyse the impact and influence which the macro environment has on a Land-based organisation and its business strategies.		<b>L01 L02 L03 L04</b>  <b>D1</b> Critique and interpret information and data applying environmental and competitive analysis to produce a set of valid strategic directions, objectives and tactical actions.
<b>P1</b> Applying appropriate frameworks, analyse the impact and influence of the macro environment on a given organisation and its strategies.	<b>M1</b> Critically analyse the macro environment to determine and inform strategic management decisions.	
<b>L02</b> Assess a Land-based organisation's internal environment and capabilities.		
<b>P2</b> Analyse the internal environment and capabilities of a given organisation using appropriate frameworks.	<b>M2</b> Critically evaluate the internal environment to assess strengths and weaknesses of an organisation's internal capabilities, structure and skill set.	
<b>L03</b> Evaluate and apply the outcomes of an analysis using Porter's Five Forces model to a given market sector.		
<b>P3</b> Applying Porter's Five Forces model, evaluate the competitive forces of a given market sector for an organisation.	<b>M3</b> Devise appropriate strategies to improve competitive edge and market position based on the outcomes.	
<b>L04</b> Apply models, theories and concepts to assist with the understanding and interpretation of strategic directions available to a Land-based organisation.		
<b>P4</b> Applying a range of theories, concepts and models, interpret and devise strategic planning for a given organisation.	<b>M4</b> Produce a strategic management plan that has tangible and tactical strategic priorities and objectives.	

## Recommended Resources

### Textbooks

JOHNSON, G. et al. (2014) *Exploring Strategy Text and Cases*. Harlow: Pearson.

JOHNSON G. et al. (2011) *Fundamentals of Strategy*. 2nd edn. Harlow: Prentice Hall.

KIM, W.C. and MAUBORGNE, R. (2015) *Blue Ocean Strategy*. Expanded edn.  
Boston: Harvard Business Review Press.

ROTHAERMEL, F. (2014) *Strategic Management*. 2nd edn. Maidenhead: McGraw-Hill.

### Links

This unit links to the following related units:

*Unit 2: Business and the Business Environment*

*Unit 31: Global Business Environment*

*Unit 34: Advanced Financial Accounting*

*Unit 35: Sustainable Practices*

## Unit 31: Global Business Environment

<b>Unit code</b>	<b>M/508/0530</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

The aim of this unit is to explore the wider position some organisations have in the global environment. Students will appreciate the complexities of operating in a global environment, and this will enable them to offer greater breadth and depth to an organisation's current or aspirational global presence.

On successful completion of this unit, students will have developed an understanding of the wider global environment in which organisations operate. This will enable students to add value to an organisation as they will be able to apply their knowledge in such a way that they could advise senior managers (in either large or small organisations) on global matters which they may not have ordinarily considered.

## **Learning Outcomes**

By the end of this unit a student will be able to:

1. Analyse the key factors which drive globalisation
2. Determine the strategic complexities associated with operating in a global environment
3. Evaluate how operating in a global market influences an organisation's structure, culture and functions
4. Evaluate the influence of globalisation on organisational decision-making and strategy.

## Essential Content

### LO1 Analyse the key factors which drive globalisation

#### *Driving factors of globalisation:*

Analyse the concept and theory of globalisation in terms of cultural, economic, political and social dimensions

What are the factors that drive globalisation? For example, international economic integration, foreign direct investment, international business and trade

Factors in relation to cost, market, environment and competition

The significant impact of the digital revolution e.g. creating better products and services at lower cost, the impact of social media and other applications (cloud computing), connecting the global community and digitised design, manufacturing and distribution systems making products and services available to a global market.

### LO2 Determine the strategic complexities associated with operating in a global environment

#### *Global strategic complexities:*

The impacts of international trade law

The economics of globalisation and the environmental impacts of globalisation in the context of the challenges they pose for risk and diversification strategies

The complexities of the international supply chain management.

### LO3 Evaluate how operating in a global market influences an organisation's structure, culture and functions

#### *Influences on structure, culture and functions:*

How does the global market influence organisations in the context of McKinsey 7S model of organisational structure?

The governance of a multi-national organisation and leadership within an international context

Using Hofstede's Dimensions of Culture, demonstrate how national cultural differences have an influence upon organisations

The influence of ethical and sustainable globalisation.

**LO4 Evaluate the influence of globalisation on organisational decision-making and strategy**

*Influences on decision-making and strategy:*

The principles of leadership change and the process of internationalisation

International expansion strategies and strategic decision-making in relation to risk and diversification

The impact of barriers to international trade upon decision-making and strategy.

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>LO1 Analyse</b> the key factors which drive globalisation			<b>LO1 LO2</b>
<b>P1</b> Analyse key factors of cost, market, environment and competition that drive global commerce and trade.		<b>M1</b> Critically analyse the impact that key factors have upon the global business environment in terms of benefits and challenges.	<b>D1</b> Critically evaluate the global business environment, including the opportunities and challenges faced by organisations.
<b>LO2</b> Determine the strategic complexities associated with operating in a global environment			
<b>P2</b> Explain the complexity of strategic challenges faced by organisations when operating in a global environment supported by specific examples.		<b>M2</b> Critically analyse strategic challenges in context of risk and diversification strategies and the supply chain flow.	
<b>LO3</b> Evaluate how operating in a global market influences an organisation's structure, culture and functions.			<b>LO3 LO4</b>
<b>P3</b> Evaluate the influences of globalisation on organisational governance and leadership, structure, culture and functions.		<b>M3</b> Critically evaluate global market influences in application to appropriate theories and models relating to organisational structure and culture.	<b>D2</b> Critique strategies that can be adopted by organisations operating in a global business environment, making valid and justified recommendations of how they should adapt their organisational structure and decision-making processes.
<b>P4</b> Evaluate the influences of ethical and sustainable globalisation on organisational functions.			
<b>LO4</b> Evaluate the influence of globalisation on organisational decision-making and strategy.			
<b>P5</b> Evaluate the different ways decision-making can work effectively in a global context.		<b>M4</b> Critically evaluate the key barriers in doing business internationally and make recommendations on how they can be overcome.	
<b>P6</b> Determine and articulate the various routes to internationalisation an organisation may adopt, including key barriers.			



## Recommended Resources

### Textbooks

BARTLETT, C. and BEAMISH, P. (2011) *Transnational Management: Texts, Cases, and Readings in Cross-Border Management*. 6th edn. Maidenhead: McGraw-Hill.

DANIELS, J.D., RADEBAUGH, L.H. and SULLIVAN, D.P. (2013) *International Business Environments and Operations*. 14th edn. Harlow: Pearson.

DERESKY, H. (2014) *International Management: Managing Across Borders and Cultures*. 8th edn. Harlow: Pearson.

GUAY, T.R. (2014) *The Business Environment of Europe: Firms, Governments, and Institutions*. Cambridge: Cambridge University Press.

PENG, M. (2014) *Global Business*. 3rd edn. Boston: Cengage Learning.

### Links

This unit links to the following related units:

*Unit 2: Business and the Business Environment*

*Unit 34: Advanced Financial Accounting*

## Unit 32: Product and Service Development

<b>Unit code</b>	<b>J/508/0534</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

Almost every day we encounter new products and services through a variety of marketing promotions; but how do they get from a single idea to, in some cases, becoming a household item and brand? How did, for instance, the mobile phone, e-books, 24/7 banking services and fast food become part of our lives? Moreover, why do some products enjoy a long and profitable life span, whilst others disappear almost overnight? What are the secrets to success?

This unit explores the journey from the generation of ideas through to the launch of a new product or service. It examines the processes behind new product development (NPD) and it also considers the potential risks involved. Through the combination of theory and practice, students will develop knowledge and understanding and be able to apply that knowledge within either an organisational or entrepreneurial context.

## **Learning Outcomes**

By the end of this unit a student will be able to:

1. Explain and demonstrate processes involved in new product or service development
2. Assess the life-cycle stage of the products or services in a company's portfolio and evaluate whether innovation, adaptation or renovation are needed for the individual products or services
3. Design and pitch a new/renovated product or service
4. Demonstrate an ability to critically reflect on the skills of team working, creative development and presentation.

## Essential Content

### LO1 **Explain and demonstrate processes involved in new product or service development**

#### *The product/service concept:*

Definition and meaning of both product and service concept e.g. tangible and intangible attributes

The level of customer integration in product/service development and marketing

The product-service system to support sustainable performance.

#### *New product/service development:*

Ideas generation, ideas screening/selection, creative methods, concept testing (marketing research) and business analysis

Risks associated with new product/service development e.g. competitor activity, customer behaviour, macro factorial and internal technical changes, levels of investment and change of strategic aims

Minimising the risk of new product failure e.g. compatibility, trialability, observability and complexity

Minimising the risks in service management e.g. intangibility, perishability, inseparability and variability

The use of digital technology in researching, designing, testing and development of new products and services

Software systems for New Product Development (NPD)

### LO2 **Assess the life-cycle stage of the products or services in a company's portfolio and evaluate whether innovation, adaptation or renovation are needed for the individual products or services**

#### *Products and services:*

Five product levels e.g. core benefits, basic product, expected product, augmented product and potential product

Market classifications of products and services within both B2C and B2B contexts.

*Product life-cycle and services:*

Different forms and operation of a product life-cycle

Product life-cycle management e.g. repositioning and revitalising the product.

*Product line and service management choices:*

Standardisation versus adaptation

Macro factors and their influence/impact upon the development of new/adapted products and services

Trends and the role of innovation

**LO3 Design and pitch a new/renovated product or service**

*New product development or service innovation:*

Market testing

Product launch (linking to marketing communications) and distribution

Guidance on designing and pitching new/adapted products/services

New or improved service launch, marketing communications and generating consumer interest

**LO4 Demonstrate an ability to critically reflect on the skills of team working, creative development and presentation.**

*Cognitive skill development:*

Theories of and approaches to reflective learning and development

Team working skill development

Creative product/service development and entrepreneurship

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>L01</b> Explain and demonstrate processes involved in new product or service development		<b>L01 L02 L03</b>  <b>D1</b> Provide a well-articulated, coherent and logically-presented pitch that has a fully justified approach to decision-making throughout the development process, market launch and distribution.
<b>P1</b> Explain the processes involved in the development of products and services and the levels of customer integration.  <b>P2</b> Apply these processes in application to the development of a specific organisational product or service.	<b>M1</b> Consistently demonstrate a justified application of subject knowledge and understanding to the processes of product or service development.	
<b>L02</b> Assess the life-cycle stage of the products or services in a company's portfolio and evaluate whether innovation, adaptation or renovation are needed for the individual products or services.		
<b>P3</b> Assess the life-cycle stage of the products or services in a company's portfolio.  <b>P4</b> Evaluate which appropriate product line management choices are required for individual products or services.	<b>M2</b> Provide a coherent and justified evaluation that is supported by material synthesised from a range of validated sources.	
<b>L03</b> Design and pitch a new/renovated product or service.		
<b>P5</b> Design and pitch a product or service taking into account market testing, product/service launch and distribution.	<b>M3</b> Design a creative, dynamic and detailed pitch that provides evidence of a well-planned, developed and evaluated product or service.	

Pass	Merit	Distinction
<b>L04</b> Demonstrate an ability to critically reflect on the skills of team working, creative development and presentation.		<b>D2</b> Provide an insightful and independent reflection on teamwork and creative development, giving valid and justified recommendations.
<b>P6</b> Complete a reflective statement that critically reflects on team working, creative development and presentation.	<b>M4</b> Address concerns and issues with recommendations for improvements.	

## Recommended Resources

### Textbooks

BRASSINGTON, F. and PETTITT, S. (2012) *Essentials of Marketing*. 3rd edn. Harlow: Pearson.

COOPER, R.G. (2011) *Winning at New Products: Creating Value through Innovation*. 4th edn. New York: Basic Books.

COOPER, R.G. (2001) *Winning at New Products: Accelerating the Process from Ideas to Launch*. 2nd edn. New York: Basic Books.

COOPER, R.G. and EDGETT, S.J. (2009) *Generating Breakthrough New Product Ideas: Feeding the Innovation Funnel*. Ontario: Product Development Institute.

### Links

This unit links to the following related units:

*Unit 12: Marketing Essentials*

*Unit 33: Identifying Entrepreneurial Opportunities*



## Unit 33: Identifying Entrepreneurial Opportunities

<b>Unit code</b>	<b>Y/508/0540</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

The role of the entrepreneur is to weigh up opportunities, threats and personal capacity to translate an opportunity into a business idea. This unit provides students with an understanding of where new venture ideas come from and gives them the opportunity to investigate and evaluate a new venture idea.

Students will explore concepts of innovation and creativity and develop creative abilities. They will learn about and use methods and frameworks to help develop and assess venture ideas, including defining product/service benefits, identifying target customers and understanding the industry and competitors from the perspective of a new entrant. They will learn about market research and apply primary and secondary research techniques to investigate a personal entrepreneurial idea, making an assessment of whether it is likely to be a commercially-viable business or social enterprise proposition.

## **Learning Outcomes**

By the end of this unit a student will be able to:

1. Evaluate possible sources for a new and innovative business idea
2. Explain the choice of a specific entrepreneurial idea for investigation and the market gap that it addresses
3. Use primary and secondary data to identify market potential
4. Evaluate the entrepreneurial idea in the context of the market and competitors and make an assessment of potential viability.

## Essential Content

### LO1 Evaluate possible sources for a new and innovative business idea

#### *Sources of business ideas:*

External/macro-environmental sources of change that create opportunities  
(Drucker's 7 sources of innovation, STEEP factors)

The role of the 'entrepreneur' in weighing up opportunities, threats and personal capacity to translate the opportunity into a business idea

Personal situational factors and knowledge

#### *Types of innovation:*

The scope of innovation, particularly in relation to small firms

The different types of innovation e.g. product and process innovation, incremental versus big bang, Schumpeter's sources of innovation

The difference between invention and innovation and the role of creativity

Exploring the difference between a product or service idea and a business idea

Innovation and location and the role of 'clusters' in fostering innovation amongst small firms

#### *Exploring creativity:*

Understand and practice using creativity techniques to generate ideas

### LO2 Explain the choice of a specific entrepreneurial idea for investigation and the market gap that it addresses

#### *Identifying customers:*

Understand the need to identify specific customer types for targeting new ideas

Behavioural, demographic and geographic segmentation

Tangible and intangible features and benefits of a product or service

#### *Understanding the industry environment:*

How the industry environment affects the likely success of a new entrant

Explore Porter's Five Forces model to analyse the attractiveness of an industry from the perspective of a new entrant

Approaches to competitor analysis relevant to entrepreneurs and small firms

Industry life-cycle

### **LO3 Use primary and secondary data to identify market potential**

#### *Market research:*

Primary and secondary research techniques for the investigation of new business ideas

Identify, plan and undertake market research required

The use of new technologies for audience research and analysis e.g. use of big data to assess market trends, internet forums and social media to test market responses and evaluation

#### *Gap analysis:*

Gap analysis to explain the gap in the market and the target customer group

### **LO4 Evaluate the entrepreneurial idea in the context of the market and competitors and make an assessment of potential viability**

#### *Methods of evaluation:*

Evaluation of ideas using SWOT, based on evidence from macro-environment, market and competitor analysis

Objective assessment of the idea to judge whether it is likely to be viable as a business or social enterprise proposition

## Learning Outcomes and Assessment

Pass		Merit	Distinction
<b>L01</b> Evaluate possible sources for a new and innovative business idea.			<b>D1</b> Critically evaluate the benefits and drawbacks of different approaches and sources that can lead to the identification of entrepreneurial ideas.
<b>P1</b> Determine and evaluate different sources of entrepreneurial ideas and innovation.		<b>M1</b> Provide a detailed evaluation of Drucker's 7 sources of systematic innovation providing specific examples.	
<b>L02</b> Explain the choice of a specific entrepreneurial idea for investigation and the market gap that it addresses.			<b>D2</b> Critically evaluate a specific entrepreneurial idea based on appropriate interpretation and investigation of the competitive market place.
<b>P2</b> Explain the rationale and the market gap for a specific entrepreneurial idea using relevant tools and techniques to support your choice.		<b>M2</b> Provide justification of how a specific entrepreneurial idea fills a market gap using different techniques for gap and competitive analysis.	
<b>L03</b> Use primary and secondary data to identify market potential.			<b>D3</b> Analyse appropriate specific sources and methods of data to provide justified business objectives and identify market potential.
<b>P3</b> Present data needed to support gap analysis in the evaluation of a specific entrepreneurial idea.		<b>M3</b> Justify specific sources and methods of data collection chosen and how data relates to identifying market potential.	
<b>P4</b> Interpret data appropriately to provide evidence of market potential.			

Pass	Merit	Distinction
<b>L04</b> Evaluate the entrepreneurial idea in the context of the market and competitors and make an assessment of potential viability.		<b>D4</b> Formulate valid conclusions and justified recommendations on how a specific entrepreneurial idea can be developed, managed and sustained within the competitive market place.
<b>P5</b> Apply a SWOT framework to collate evidence to support an objective assessment of a specific entrepreneurial idea.  <b>P6</b> Evaluate the competitive and market environments in which the idea will be launched to assess potential viability.	<b>M4</b> Critically evaluate a specific entrepreneurial idea in the context of the marketplace and competition.	

## Recommended Resources

### Textbooks

BURNS, P. (2014) *New Venture Creation: A Framework for Entrepreneurial Start-ups*. Basingstoke: Palgrave MacMillan.

BURNS, P. (2011) *Entrepreneurship and Small Business*. 3rd edn. Basingstoke: Palgrave MacMillan.

MOLE, K. and RAM, M. (2012) *Perspectives in Entrepreneurship: A Critical Approach*. Basingstoke: Palgrave MacMillan.

RIES, E. (2011) *The Lean Start-up*. London: Penguin Books.

WALL, S., CODAY, C. and MITCHELL, C. (2014) *Quantitative Methods for Business and Management: An Entrepreneurial Perspective*. Harlow: Pearson.

### Websites

<a href="http://www.isbe.org.uk">www.isbe.org.uk</a>	The Institute for Small Business and Entrepreneurship (ISBE) Homepage (General reference)
<a href="http://onlinelibrary.wiley.com">http://onlinelibrary.wiley.com</a>	Wiley Online Library Journal of Small Business Management (Journal)

### Links

This unit links to the following related units:

*Unit 30: Business Strategy*

*Unit 32: Product and Service Development*

## Unit 34: Advanced Financial Accounting

<b>Unit code</b>	<b>J/616/7974</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

The day-to-day accounts of the Land-based business are the basis of the statutory accounts that are produced for HMRC. Business managers can also present their accounts in certain formats to support decision-making – whether this is at individual enterprise level or for the business as a whole. Preparing and understanding these accounts is vital to the development of the business and how it progresses and grows in the future.

The overall aim of this unit is to develop the student's understanding of how the day-to-day accounts operate and are used to compile the year-end accounts, to assist in the production of budgets and forecasts for the upcoming year and to provide management reports for budget and cash flow analysis.

On successful completion of this unit, students will be able to prepare a draft set of accounts for the accountant from their own financial records and to understand appraisal techniques of accounts.



## **Learning Outcomes**

By the end of this unit students will be able to:

1. Perform the necessary period end adjustments to the day-to-day accounts to enable statutory accounts to be produced
2. Demonstrate through the production of a profit and loss account and appraisal techniques an assessment of business performance
3. Demonstrate through the production of a balance sheet and appraisal techniques an assessment of the business performance
4. Interpret the accounts as a basis for producing budgets and forecasts for business financial sustainability and development.

## Essential content

### LO1 **Perform the necessary period end adjustments to the day-to-day accounts to enable statutory accounts to be produced**

#### *Period year-end adjustments:*

Make the necessary period end adjustments to the day-to-day accounts to enable statutory accounts to be produced

Understand and compute accruals and prepayments for both income and expenses at the period end

#### *Maintain a Fixed Asset register and compute depreciation for the period:*

Understanding of straight line and reducing balance methods

#### *Stock valuations:*

Prepare a stock valuation for the business at the period end e.g. both live and dead stock and growing crop computations

### LO2 **Demonstrate through the production of a profit and loss account and appraisal techniques an assessment of business performance**

#### *Compile a profit and loss account:*

Prepare and calculate a profit and loss account for a Land-based business

Understand the differences between variable costs (cost of production) and fixed costs (overheads)

Compute and understand profit and loss ratio analysis and their use for appraising a Land-based business

### LO3 **Demonstrate through the production of a balance sheet and appraisal techniques an assessment of the business performance**

#### *Compile a balance sheet account:*

Prepare and calculate a balance sheet account for a Land-based business

Understand the differences in the structure of the balance sheet for different corporate entities (sole trader, partnerships, limited company)

Compute and understand balance sheet ratio analysis and their use for appraising the business

#### **LO4 Interpret the accounts as a basis for producing budgets and forecasts for business financial sustainability and development**

##### *Budgets and forecasts:*

Use the past accounts to predict volumes and quantities of income and expenditure

Calculate individual enterprise accounts (Gross Margins)

Understand how proposed changes to enterprises will affect both enterprise and overhead forecasts

Calculate overhead (Fixed Costs) forecasts

Calculate a budgets Profit or Loss account

##### *Cash flow forecast:*

Calculate a cash flow forecast for a Land-based business identifying business, private and capital expenditure

##### *Monitoring and control:*

Evaluate how the monitoring of actual performance compares against budget/forecast performance and how this can affect the management of the Land-based business.

## Learning Outcomes and Assessment Criteria

Pass		Merit	Distinction
<b>L01</b> Perform the necessary period end adjustments to the day-to-day accounts to enable statutory accounts to be produced.			<b>D1</b> Evaluate the effects of computing period end adjustments on the accounts.
<b>P1</b> Identify and compute accruals and a prepayment schedule. <b>P2</b> Assess the methods of depreciation calculation for fixed assets.		<b>M1</b> Compute period end stock and growing crop valuations.	
<b>L02</b> Demonstrate through the production of a profit and loss account and appraisal techniques an assessment of business performance.			<b>D2</b> Evaluate margin ratios and their use in appraising a Land-based business.
<b>P3</b> Identify and prepare the elements that constitute a profit and loss account. <b>P4</b> Identify variable and fixed costs and explain the differences between them.		<b>M2</b> Compute profit and loss margin ratios.	
<b>L03</b> Demonstrate through the production of a balance sheet and appraisal techniques an assessment of the business performance.			<b>D3</b> Critically evaluate the accounts of a business by using Capital ratios in appraising its performance.
<b>P5</b> Identify and prepare the elements that constitute a balance sheet account. <b>P6</b> Identify the differences in the structure of the balance sheet for different corporate entities.		<b>M3</b> Compute balance sheet margin ratios.	
<b>L04</b> Interpret the accounts as a basis for producing budgets and forecasts for business financial sustainability and development.			<b>D4</b> Critically evaluate the monitoring of actual performance versus budget/forecast that could affect the management of the business.
<b>P7</b> Produce Enterprise forecasts for 3 individual enterprises. <b>P8</b> Produce Overhead forecasts for a business.		<b>M4</b> Assess the effect of enterprise changes on the whole business forecast.	

## Recommended resources

### Textbooks

IAgSA. (2016) *The Farm Office Handbook*. Ipswich: Old Pond Publishing Ltd

### Links

This unit links to the following related units:

*Unit 2: Business and the Business Environment*

*Unit 10: Rural Business Administration and Accounting*

*Unit 11: Human Resource Management*

*Unit 13: Management Accounting*

## Unit 35: Sustainable Practices

<b>Unit code</b>	<b>D/616/7866</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

The concept of sustainability and sustainable practices has many interpretations. For the purpose of this unit, sustainable practices are defined as operations carried out with minimum impact, allowing those practices to be continued in the long term. Sustainable practices need to be applied to both inputs and outputs from a business. Consideration needs to be given to the resources used in production, the energy used to process those resources and the management of any waste products arising. To secure the future of production, businesses must seek to minimise their negative impacts in carrying out their operations.

This unit will develop the skills required to analyse business activities from the perspective of sustainability. It will allow systems and practices to be reviewed to minimise energy use and waste production, enabling the reduction of negative impacts on the environment. Once practices have been reviewed, and impacts minimised, the use of green business credentials in marketing will be explored.

During unit delivery, local and national schemes to which a business can sign up will be identified and eligibility criteria examined. Methods for evaluating a business's environmental impact will be developed. Opportunities for local sourcing, collective purchasing and transportation and packaging minimisation will be explored. The application of the waste hierarchy will be explored so that resource waste can be eliminated. Utilising green business credentials will be optimised.

By the end of the unit, students will have developed the skills to review business activities in order to minimise environmental impacts and utilise the green business credentials while promoting and marketing business activities and products. They will also be able to identify appropriate schemes and initiatives which could support sustainable business aims.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Evaluate the opportunities for applying sustainable practices to business operations
2. Analyse business facilities and practices to minimise energy use
3. Identify opportunities for waste minimisation and recycling
4. Utilise sustainable practices in business promotion.

## Essential content

### LO1 **Evaluate the opportunities for applying sustainable practices to business operations**

*All aspects of business practices need to be considered:*

Identify opportunities to minimise the risk of loss or damage to land, water and air

Practices which minimise resource requirement need to be explored

Consideration must be given to the sourcing of inputs to ensure they continue to be available for production in the future.

### LO2 **Analyse business facilities and practices to minimise energy use**

*Technologies and systems which minimise energy use need to be explored:*

These need to include insulation and thermal efficiency of buildings

The adoption of energy-efficient production methods

The development of maintenance schedules for equipment

The evaluation of latest technologies for energy saving.

### LO3 **Identify opportunities for waste minimisation and recycling**

*Methods of reducing waste need to be explored:*

Matching of systems to local circumstances

Stock control to be practiced

Avoidance of excess packaging

Use of biodegradable products

Storing and sorting waste products to maximise recycling opportunities

Preventing waste escaping into the wider environment

The waste hierarchy needs to be followed

Non-recyclable waste disposal in accordance with current legislation.



#### LO4 **Utilise sustainable practices in business promotion.**

*Marketing opportunities utilising the business' sustainable reputation need to be developed:*

Quality Assurance schemes requiring sustainable practices to be reviewed

Niche marketing to be investigated

Opportunities for spreading sustainable practices up and down the supply chain to be explored.

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>L01</b> Evaluate the opportunities for applying sustainable practices to business operations		<b>L01 L02</b> <b>D1</b> Critically evaluate potential savings and costs from applying sustainable practices.
<b>P1</b> Produce a risk plan of activities and their negative impacts. <b>P2</b> Identify sustainable practices which would reduce the risks. <b>P3</b> Identify sustainable sources for business inputs.	<b>M1</b> Evaluate the impact of the risk plan and viability of changing input sources.	
<b>L02</b> Analyse business facilities and practices to minimise energy use.		
<b>P4</b> Produce an environmental audit of business premises and practices.	<b>M2</b> Evaluate feasibility of applying technologies.	
<b>L03</b> Identify opportunities for waste minimisation and recycling.		<b>L03 L04</b> <b>D2</b> Critically evaluate potential savings and costs from applying sustainable practices.
<b>P5</b> Produce a waste management audit for the business.	<b>M3</b> Evaluate waste minimisation opportunities in the local area.	
<b>L04</b> Utilise sustainable practices in business promotion.		
<b>P6</b> Produce a marketing plan which makes use of the business' environmental credentials.	<b>M4</b> Evaluate your plan against plans of similar businesses.	

## Recommended resources

### Textbooks

ESTES, J. (2009) *Smart Green: How to Implement Sustainable Business Practices in Any Industry – and Make Money*. New Jersey: Wiley.

HALL, K. (2008) *Green Building Bible – Fourth Edition, Volume 1: Essential Information to Help You Make Your Home and Buildings Less Harmful to the Environment, the Community and Your Family*. London: Green Building Press.

### Websites

<a href="http://www.energysavingtrust.org.uk">www.energysavingtrust.org.uk</a>	The Energy Saving Trust Whole site (General reference)
<a href="http://www.gov.uk">www.gov.uk</a>	GOV.UK Publications DEFRA (2009) Protecting our Water, Soil and Air: A Code of Good Agricultural Practice for farmers, growers and land managers (Publication) DEFRA (2011) Waste Hierarchy Guidance (Publication)

### Links

This unit links to the following related units:

*Unit 2: Business and the Business Environment*

*Unit 13: Management Accounting*

*Unit 34: Advanced Financial Accounting*

## Unit 36: Work Experience

<b>Unit code</b>	<b>H/616/7867</b>
<b>Unit level</b>	<b>5</b>
<b>Credit value</b>	<b>15</b>

### Introduction

A crucial part of a professional's skills, abilities and competences are developed during work, and are refined through practical experiences and 'learning by doing'. Employers rate work experience above all else and the HN qualifications aim to make students work-ready and prepare them with the appropriate, balanced skills profile that employers require.

Integral to achieving 'work readiness' is the need for practical application and contextualisation of learning – a perspective that is increasingly sought after by employers. Curriculum that helps students gain real-world, relevant experience in their chosen careers have proven to be an enabler for graduate progression to employment and of considerable value to students' personal and professional development.

This unit aims to enable students to develop personal and professional skills by engaging in practical tasks and activities within a relevant workplace. It is designed to facilitate supervised learning in a workplace that can be fit around full-time or part-time student commitments and enables both an employer, as well as an academic supervisor, to monitor and support students through a goal-orientated process. **The minimum work experience hours required for completion is 80 hours.**

Students will be given the opportunity to identify and plan their own skills development in line with a chosen career path or direction. It will be expected that students negotiate and agree work experience in an appropriate work context, agreed by the employer and academic supervisor. They will monitor and record evidence from the tasks and activities that they undertake, to allow them to evaluate the process and any shortcomings in their development going forward.

## **Learning Outcomes**

By the end of this unit students will be able to:

1. Investigate the value and benefits of practical work experience for career and personal development
2. Plan suitable and relevant work experience in an appropriate service sector organisation
3. Undertake appropriate work experience to develop professional skills and competences
4. Evaluate personal skills and competences developed during practical work experiences.

## Essential content

### LO1 Investigate the value and benefits of practical work experience for career and personal development

*Organisational contexts for career development:*

Different service sector sub-sectors and organisational contexts

The key roles and responsibilities found within different service sub-sectors.

*Learning and development in work environments:*

Academic knowledge versus practical knowledge and skills

Learning theories e.g. Blooms taxonomy, Gardner's Multiple Intelligences and Bandura's Social Learning Theory

Concept of application of theory to practice

The benefits of practical learning

Career progression and employer expectations of key employability skills

e.g. interpersonal skills, communication skills, critical thinking, presentation skills, leadership skills, teamwork

The importance and value of soft skills to the hospitality industry

Soft skills versus hard skills

### LO2 Plan suitable and relevant work experience in an appropriate service sector organisation

*Setting development plans, goals and objectives:*

'SMART' planning, writing of goals and objectives

Self-assessment of skills and competences.

*Learning and development approaches:*

Visual, Auditory, Kinaesthetic (VAK) learning styles, Honey & Mumford learning cycle, Kolb's learning cycle

Different learning approaches e.g. shadowing, in-house courses and on-job training, online learning, formal training, buddying, secondment, coaching and mentoring, job rotation, workshops, conferences.

*Preparation tools and techniques for career development:*

Looking at job applications, CV and interview preparation

Interview and presentation skills

The importance of understanding the appropriate uniform and dress-code for the job role in relation to the interview process

Service sub-sector specific equipment and requirements.

### **LO3 Undertake appropriate work experience to develop professional skills and competences**

*Carry out planned tasks and activities:*

Engagement in tasks e.g. projects, routine duties, operational issues, formal training, legal compliance, process development

People management and leadership

Application of problem solving, contingency planning, coordinating tasks, teamwork

Professional conduct and behaviours to display whilst working, presenting a brand identity, the importance of uniformity in presentation

### **LO4 Evaluate personal skills and competences developed during practical work experiences**

*Recording of actions and activities in suitable formats:*

Methodical record of experiences gained during work, linked to skills to be developed

Recorded in appropriate methods e.g. journal, logbook, diary, portfolios, online records

Creation of evidence in appropriate formats

*Reviewing and evaluating progress:*

Reflection of career development and learning within the work environment in areas e.g. systems, interpersonal skills, problem-resolution, incidents and accidents, teamwork and management practices

Recommendations on how to enhance future development plans e.g. different work context, alternative roles and titles, locations, preparation methods, time management

## Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<b>L01</b> Investigate the value and benefits of practical work experience for career and personal development.		<b>D1</b> Critically evaluate the benefits of practical action learning to underpin theory and approaches in the work environment.
<b>P1</b> Explore and discuss different learning theories that could be used to inform a suitable work experience.  <b>P2</b> Examine the benefits of practical work experience for professional skills and career development.	<b>M1</b> Evaluate a range of different learning theories in practice, to highlight and emphasise the benefits of action-learning for career development.	
<b>L02</b> Plan suitable and relevant work experience in an appropriate service sector organisation.		<b>D2</b> Analyse and interpret actions, activities and approaches adopted within a structured development plan to gain appropriate work experience within a service sector organisation.
<b>P3</b> Construct a development plan for skills and career advancement within a chosen service sector context.  <b>P4</b> Explain a range of tools and techniques that can be used to acquire appropriate work experience within a service sector organisation.	<b>M2</b> Devise an in-depth development plan that provides a detailed outline of the approaches, tools and techniques applied to gain appropriate work experience within a service sector organisation.	
<b>L03</b> Undertake appropriate work experience to develop professional skills and competences.		<b>D3</b> Critically reflect on development processes within the workplace to establish strengths and weaknesses of the different approaches adopted.
<b>P5</b> Conduct appropriate work experience to develop specific skills for career development whilst producing ongoing evidence of work performance.	<b>M3</b> Examine the development processes within a work context to maximise growth opportunities within the work experience.	



Pass	Merit	Distinction
<b>L04</b> Evaluate personal skills and competences developed during practical work experiences.		<b>D4</b> Justify the evaluation and recommendations of different approaches to enhancing development in practice.
<b>P6</b> Evaluate skills, performance and career development to identify areas for future advancement.  <b>P7</b> Recommend methods and techniques to enhance development processes within the given service sector work environment.	<b>M4</b> Produce an evidence-based evaluation of work experiences, making actionable and tangible recommendations for enhanced development processes.	

## Recommended resources

### Textbooks

COSTLEY, C., ELLIOT, G. and GIBBS, P. (2010) *Doing Work-based Research: Approaches to Enquiry for Insider-Researchers*. London: SAGE.

DONE, J. & MULVEY, R. (2011) *Brilliant Graduate Career Handbook*. Essex: Prentice Hall.

KIRTON, B. (2012) *Brilliant Workplace Skills for Students & Graduates*. Harlow: Prentice Hall.

ROOK, S. (2016) *Work Experience, Placements & Internships*. London: Palgrave.

### Websites

<a href="http://www.cipd.co.uk">www.cipd.co.uk</a>	Chartered Institute of Personnel and Development Homepage (General reference)
<a href="http://www.mindtools.com">www.mindtools.com</a>	Mind Tools Career Support Resources (General reference)
<a href="http://www.nationalcareersservice.direct.gov.uk">www.nationalcareersservice.direct.gov.uk</a>	National Careers Service CVs, Skills Health Check (General reference)

# 11 Appendices

## Appendix 1: Mapping of HND in Horticulture against FHEQ Level 5

Key	
KU	Knowledge and Understanding
CS	Cognitive Skills
AS	Applied Skills
TS	Transferable Skills

The qualification will be awarded to students who have demonstrated:

FHEQ Level 5 descriptor		Horticulture HND Programme Outcome
Knowledge and critical understanding of the well-established principles of their area(s) of study, and of the way in which those principles have developed.	KU1	Knowledge and understanding of the fundamental principles and practices of the contemporary global horticultural industry.
	KU2	Knowledge and understanding of the external horticultural industrial environment and its impact upon local, national and global levels of strategy, behaviour, management and sustainability.
	KU3	Understanding and insight into different horticultural practices, their diverse nature, purposes, structures and operations and their influence upon the external environment.
	KU4	A critical understanding of the ethical, legal, professional, and operational frameworks within which the horticultural industries operate.
	KU5	A critical understanding of processes, procedures and practices for effective management of products, services and people.
	KU6	A critical understanding of the evolving concepts, theories and models within the study of horticulture across a range of practical and hypothetical scenarios.

FHEQ Level 5 descriptor		Horticulture HND Programme Outcome
	KU7	An ability to evaluate and analyse a range of concepts, theories and models to make appropriate horticultural decisions.
	KU8	An appreciation of the concepts and principles of CPD, staff development, leadership and reflective practice as methods and strategies for personal and people development.
Ability to apply underlying concepts and principles outside the context in which they were first studied, including, where appropriate, the application of those principles in an employment context.	CS1	Apply knowledge and understanding of essential concepts, principles and models within the contemporary global horticultural industries.
	AS1	Evidence the ability to show client relationship management and develop appropriate policies and strategies to meet stakeholder expectations.
	AS2	Apply innovative agricultural ideas to develop and create new products or services that respond to the changing nature of the horticultural industries.
	AS3	Integrate theory and practice through the investigation and examination of practices in the workplace.
	AS4	Develop outcomes for clients/businesses using appropriate practices and data to make justified recommendations.
	CS2	Develop different strategies and methods to show how resources (human, financial and information) are integrated and effectively managed to successfully meet objectives.

<b>FHEQ Level 5 descriptor</b>		<b>Horticulture HND Programme Outcome</b>
Knowledge of the main methods of enquiry in the subject(s) relevant to the named award, and ability to evaluate critically the appropriateness of different approaches to solving problems in the field of study.	CS3	Critically evaluate current principles of the horticultural industries, and their application to problem-solving.
	CS4	Apply project management tools/techniques for reporting and planning, control and problem-solving.
	KU9	Knowledge and understanding of how the horticultural industries influence the development of people and businesses.
	CS5	Critique a range of horticultural technology systems and operations, and their application, to maximise and successfully meet strategic objectives.
	KU10	An understanding of the appropriate techniques and methodologies used to resolve real-life problems in the workplace.
An understanding of the limits of their knowledge, and how this influences analysis and interpretations based on that knowledge.	TS1	Develop a skill-set to enable the evaluation of appropriate actions taken for solving problems in a specific horticultural context.
	TS2	Self-reflection, including self-awareness; the ability to become an effective independent student and appreciate the value of the self-reflection process.

Typically, holders of the qualification will be able to:

<b>FHEQ Level 5 descriptor</b>		<b>Horticulture HND Programme Outcome</b>
Use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis.	TS3	Competently use digital literacy to access a broad range of research sources, data and information.
	CS6	Interpret, analyse and evaluate a range of data, sources and information to inform evidence-based decision-making.
	CS7	Synthesise knowledge and critically evaluate strategies and plans to understand the relationship between theory and real-world horticultural industry scenarios.
Effectively communicate information, arguments and analysis in a variety of forms to specialist and non-specialist audiences, and deploy key techniques of the discipline effectively.	TS4	Communicate confidently and effectively, both orally and in writing, internally and externally, with horticultural industry professionals and other stakeholders.
	TS5	Communicate ideas and arguments in an innovative manner using a range of digital media.
	AS5	Locate, receive and respond to a variety of information sources (e.g. textual, numerical, graphical and computer-based) in defined contexts.
	TS6	Demonstrate strong interpersonal skills, including effective listening and oral communication skills, as well as the associated ability to persuade, present, pitch and negotiate.
Undertake further training, develop existing skills and acquire new competences that will enable them to assume significant responsibility within organisations.	TS7	Identify personal and professional goals for Continuing Professional Development to enhance competence to practise within a chosen horticultural field.
	TS8	Take advantage of available pathways for Continuing Professional Development through higher education and Professional Body Qualifications.

Holders will also have:

FHEQ Level 5 descriptor		Horticulture HND Programme Outcomes
The qualities and transferable skills necessary for employment requiring the exercise of personal responsibility and decision-making.	TS9	Develop a range of skills to ensure effective team working, independent initiatives, organisational competence and problem-solving strategies.
	TS10	Reflect adaptability and flexibility in approach to horticulture, showing resilience under pressure and meeting challenging targets within given deadlines.
	TS11	Use quantitative skills to manipulate data, evaluate and verify existing theory.
	CS8	Evaluate the changing needs of the horticultural industries and have confidence to self-evaluate and undertake additional CPD as necessary.
	TS12	Emotional intelligence and sensitivity to diversity in relation to people and cultures.



## Appendix 2: HNC/HND Horticulture Programme Outcomes for Students

	Knowledge and Understanding										Cognitive skills								Applied skills					Transferable skills											
Unit	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	1	2	3	4	5	1	2	3	4	5	6	7	8	9	10	11	12
1	X	X	X				X				X				X	X			X		X	X	X	X		X	X					X	X		X
2	X	X	X				X				X				X	X			X		X	X	X	X		X	X					X	X		X
3	X	X	X	X		X	X	X		X	X	X	X	X		X	X		X	X	X		X		X	X	X	X	X	X		X	X		
4	X	X	X	X		X	X			X	X		X			X	X			X	X		X	X		X	X	X	X			X	X	X	X
5	X	X	X	X		X	X	X		X	X	X	X	X		X	X		X	X	X		X		X	X	X	X	X	X		X	X		
6	X	X	X	X			X		X		X		X		X	X	X				X		X	X		X	X	X	X			X	X		
7	X	X	X	X	X	X	X		X		X		X	X	X	X	X			X	X	X	X	X		X	X	X	X			X	X		
8	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X			X	X		X	X		X	X	X				X	X		X
9	X	X	X	X	X		X			X	X		X	X	X	X	X				X		X			X	X		X	X		X	X		X
10	X				X		X			X		X		X		X	X		X		X	X		X		X	X					X			X
11	X	X		X	X	X	X	X	X	X		X				X	X	X			X					X	X					X	X		X
12	X					X	X				X		X		X		X		X	X	X	X	X			X	X				X		X		
13	X				X		X			X		X		X		X	X		X		X	X		X		X	X				X	X		X	
14	X		X	X			X	X				X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
15	X	X	X	X		X	X				X	X	X		X	X	X				X		X	X		X	X	X	X			X	X		X
16	X	X	X		X	X	X		X			X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X			X	X		X

	Knowledge and Understanding										Cognitive skills								Applied skills					Transferable skills											
Unit	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	1	2	3	4	5	1	2	3	4	5	6	7	8	9	10	11	12
17	X		X			X	X				X		X		X		X		X	X	X	X	X			X	X	X			X	X	X		
18	X		X			X	X				X		X			X	X				X		X	X		X	X	X	X	X		X	X		X
19	X		X			X	X				X		X		X	X	X				X		X			X	X	X	X			X	X		X
20	X		X			X	X				X		X	X	X	X	X				X		X	X		X	X	X	X	X		X	X	X	
21	X		X		X	X	X			X	X	X	X		X	X			X		X	X	X	X		X	X				X	X	X	X	
22	X	X	X	X	X	X	X				X		X		X	X	X			X	X		X			X	X	X	X			X	X		X
23	X		X			X	X				X		X			X	X				X		X			X	X		X			X	X		X
24	X		X			X	X	X			X		X			X	X	X		X	X	X	X	X	X	X	X	X				X	X	X	
25	X		X	X		X	X				X		X			X	X				X		X			X	X	X	X			X	X		X
26	X		X	X		X	X				X		X		X	X	X				X		X			X	X	X	X			X	X		X
27	X		X	X		X	X				X		X			X	X				X		X			X	X		X			X	X		X
28	X		X			X	X				X		X		X	X	X				X		X	X		X	X		X			X	X		
29	X	X	X	X	X	X	X				X		X			X	X				X		X			X	X		X			X	X		X
30	X		X			X	X	X			X		X			X	X	X		X	X	X	X	X	X	X	X	X				X	X		X
31	X		X			X	X				X		X		X	X	X				X		X	X		X	X		X			X	X		
32	X		X			X	X				X		X		X	X	X				X		X	X		X	X		X			X	X		
33	X		X	X		X	X			X	X		X			X	X			X	X		X	X		X	X	X	X			X	X		X
34	X		X	X	X	X	X		X	X	X		X	X	X	X	X		X		X	X	X	X		X	X	X	X	X		X	X	X	X

	Knowledge and Understanding										Cognitive skills								Applied skills					Transferable skills											
Unit	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	1	2	3	4	5	1	2	3	4	5	6	7	8	9	10	11	12
35	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X		X		X	X	X	X		X	X		X		X	X	X	X	
36	X	X	X	X		X	X		X		X		X			X	X				X		X			X	X		X			X	X		X

## Appendix 3: Glossary of terms used for internally assessed units

This is a summary of the key terms used to define the requirements within units.

Term	Definition
Analyse	<p>Present the outcome of methodical and detailed examination either:</p> <ul style="list-style-type: none"> <li>• breaking down a theme, topic or situation in order to interpret and study the interrelationships between the parts and/or</li> <li>• of information or data to interpret and study key trends and interrelationships.</li> </ul> <p>Analysis can be through activity, practice, written or verbal presentation.</p>
Apply	<p>Put into operation or use.</p> <p>Use relevant skills/knowledge/understanding appropriate to context.</p>
Arrange	Organise or make plans.
Assess	Offer a reasoned judgement of the standard/quality of a situation or a skill informed by relevant facts.
Calculate	Generate a numerical answer with workings shown.
Compare	<p>Identify the main factors relating to two or more items/situations or aspects of a subject that is extended to explain the similarities, differences, advantages and disadvantages.</p> <p>This is used to show depth of knowledge through selection of characteristics.</p>
Compose	Create or make up or form.
Communicate	<p>Convey ideas or information to others.</p> <p>Create/construct skills to make or do something, for example a display or set of accounts.</p>
Create/ Construct	Skills to make or do something, for example, a display or set of accounts.
Critically analyse	Separate information into components and identify characteristics with depth to the justification.
Critically evaluate	Make a judgement taking into account different factors and using available knowledge/experience/evidence where the judgement is supported in depth.
Define	State the nature, scope or meaning.
Describe	Give an account, including all the relevant characteristics, qualities and events.

Term	Definition
Discuss	Consider different aspects of a theme or topic, how they interrelate, and the extent to which they are important.
Demonstrate	Show knowledge and understanding.
Design	Plan and present ideas to show the layout/function/workings/object/system/process.
Develop	Grow or progress a plan, ideas, skills and understanding
Differentiate	Recognise or determine what makes something different.
Discuss	Give an account that addresses a range of ideas and arguments.
Evaluate	<p>Work draws on varied information, themes or concepts to consider aspects, such as:</p> <ul style="list-style-type: none"> <li>• strengths or weaknesses</li> <li>• advantages or disadvantages</li> <li>• alternative actions</li> <li>• relevance or significance.</li> </ul> <p>Students' inquiries should lead to a supported judgement showing relationship to its context. This will often be in a conclusion. Evidence will often be written but could be through presentation or activity.</p>
Explain	To give an account of the purposes or reasons.
Explore	Skills and/or knowledge involving practical research or testing.
Identify	Indicate the main features or purpose of something by recognising it and/or being able to discern and understand facts or qualities.
Illustrate	Make clear by using examples or provide diagrams.
Indicate	Point out, show.
Interpret	State the meaning, purpose or qualities of something through the use of images, words or other expression.
Investigate	Conduct an inquiry or study into something to discover and examine facts and information.
Justify	<p>Students give reasons or evidence to:</p> <ul style="list-style-type: none"> <li>• support an opinion</li> <li>• prove something is right or reasonable.</li> </ul>
Outline	Set out the main points/characteristics.
Plan	Consider, set out and communicate what is to be done.
Produce	To bring into existence.
Reconstruct	To assemble again/reorganise/form an impression.

Term	Definition
Report	Adhere to protocols, codes and conventions where findings or judgements are set down in an objective way.
Review	<p>Make a formal assessment of work produced.</p> <p>The assessment allows students to:</p> <ul style="list-style-type: none"> <li>• appraise existing information or prior events</li> <li>• reconsider information with the intention of making changes, if necessary.</li> </ul>
Show how	Demonstrate the application of certain methods/theories/concepts.
Stage and manage	Organisation and management skills, for example, running an event or a Sport pitch.
State	Express.
Suggest	Give possible alternatives, produce an idea, put forward, for example, an idea or plan, for consideration.
Undertake/ carry out	Use a range of skills to perform a task, research or activity.

This is a key summary of the types of evidence used for BTEC Higher Nationals:

Type of evidence	Definition
Case study	A specific example to which all students must select and apply knowledge.
Project	A large scale activity requiring self-direction of selection of outcome, planning, research, exploration, outcome and review.
Independent research	An analysis of substantive research organised by the student from secondary sources and, if applicable, primary sources.
Written task or report	Individual completion of a task in a work-related format, for example, a report, marketing communication, set of instructions, giving information.
Simulated activity/role play	A multi-faceted activity mimicking realistic work situations.
Team task	Students work together to show skills in defining and structuring activity as a team.
Presentation	Oral or through demonstration.
Production of plan/business plan	Students produce a plan as an outcome related to a given or limited task.
Reflective journal	Completion of a journal from work experience, detailing skills acquired for employability.
Poster/leaflet	Documents providing well-presented information for a given purpose.

## Appendix 4: Assessment methods and techniques for Higher Nationals

Assessment technique	Description	Transferable skills development	Formative or Summative
Academic graphic display	This technique asks students to create documents providing well-presented information for a given purpose. Could be a hard or soft copy.	Creativity  Written communication  Information and communications  Technology  Literacy	Formative  Summative
Case study	This technique present students with a specific example to which they must select and apply knowledge.	Reasoning  Critical thinking  Analysis	Formative  Summative
Discussion forum	This technique allows students to express their understanding and perceptions about topics and questions presented in the class or digitally, for example, online groups, blogs.	Oral/written communication  Appreciation of diversity  Critical thinking and reasoning  Argumentation	Formative



Assessment technique	Description	Transferable skills development	Formative or Summative
Independent research	This technique is an analysis of research organised by the student from secondary sources and, if applicable, primary sources.	Information and communications technology  Literacy  Analysis	Formative
Oral/Viva	This technique asks students to display their knowledge of the subject via questioning.	Oral communication  Critical thinking  Reasoning	Summative
Peer review	This technique asks students to provide feedback on each other's performance. This feedback can be collated for development purposes.	Teamwork  Collaboration  Negotiation	Formative  Summative
Presentation	This technique asks students to deliver a project orally or through demonstration.	Oral communication  Critical thinking  Reasoning  Creativity	Formative  Summative

Assessment technique	Description	Transferable skills development	Formative or Summative
Production of an artefact/ performance or portfolio	This technique requires students to demonstrate that they have mastered skills and competencies by producing something. Some examples are [Sector] plans, using a piece of equipment or a technique, building models, developing, interpreting, and using maps.	Creativity  Interpretation  Written and oral communication  Interpretation Decision-making  Initiative  Information and Communications  Technology  Literacy, etc.	Summative
Project	This technique is a large scale activity requiring self-direction, planning, research, exploration, outcome and review.	Written communication  Information  Literacy,  Creativity,  Initiative.	Summative

Assessment technique	Description	Transferable skills development	Formative or Summative
Role playing	This technique is a type of case study, in which there is an explicit situation established, with students playing specific roles, understanding what they would say or do in that situation.	Written and oral communication  Leadership  Information literacy  Creativity  Initiative.	Formative
Self-reflection	This technique asks students to reflect on their performance, for example, to write statements of their personal goals for the course at the beginning of the course, what they have learned at the end of the course and their assessment of their performance and contribution; completion of a reflective journal from work experience, detailing skills acquired for employability.	Self-reflection  Written communication  Initiative  Decision-making  Critical thinking	Summative
Simulated activity	This technique is a multi-faceted activity based on realistic work situations.	Self-reflection  Written communication  Initiative  Decision-making  Critical thinking	Formative  Summative

Assessment technique	Description	Transferable skills development	Formative or Summative
Team assessment	<p>This technique asks students to work together to show skills in defining and structuring an activity as a team.</p> <p>All team assessment should be distributed equally, each of the group members performing their role, and then the team collates the outcomes, and submits it as a single piece of work.</p>	<p>Collaboration</p> <p>Teamwork</p> <p>Leadership</p> <p>Negotiation</p> <p>Written and oral communication</p>	Formative Summative
Tiered knowledge	<p>This technique encourages students to identify their gaps in knowledge. Students record the main points they have captured well and those they did not understand.</p>	<p>Critical thinking</p> <p>Analysis</p> <p>Interpretation</p> <p>Decision-making</p> <p>Oral and written communication</p>	Formative
Time constrained assessment	<p>This technique covers all assessment that needs to be done within a centre-specified time constrained period on-site.</p>	<p>Reasoning</p> <p>Analysis</p> <p>Written communication</p> <p>Critical thinking</p> <p>Interpretation</p>	Summative

Assessment technique	Description	Transferable skills development	Formative or Summative
Top ten	This technique asks students to create a 'top ten' list of key concepts presented in the assigned reading list.	Teamwork  Creativity  Analysis  Collaboration	Formative
Written task or report	This technique asks students to complete an assignment in a structured written format, for example, a [Sector] plan, a report, marketing communication, set of instructions, giving information.	Reasoning  Analysis  Written communication  Critical thinking, interpretation.	Summative

## Appendix 5: Transferable skills mapping

### Level 4 Higher National Certificate in Horticulture: mapping of transferable employability and academic study skills

Skill Sets	Cognitive skills						Intra-personal Skills					Interpersonal Skills		
	Problem-solving	Critical Thinking/ Analysis	Decision-making	Effective Communication	Digital Literacy	Numeracy	Creativity	Plan Prioritise	Self-management	Independent learning	Self-reflection	Team work	Leadership	Cultural Awareness
1		X	X	X	X			X	X	X	X			X
2	X	X	X		X	X		X	X	X	X			
3	X	X	X	X	X		X	X	X	X	X	X	X	
4	X	X	X	X		X		X	X	X				X
5	X	X	X	X				X	X	X		X		X
6	X	X	X	X	X	X		X	X	X				X
7	X	X	X	X	X	X		X	X	X		X	X	X
8	X	X	X	X	X			X	X	X	X	X		X
9	X	X	X	X	X	X	X	X	X	X	X	X	X	
10	X	X	X	X		X		X	X	X	X		X	X
11	X	X	X	X	X		X	X	X	X	X	X	X	X
12	X	X	X	X	X		X	X	X	X	X	X	X	X

Skill Sets	Cognitive skills						Intra-personal Skills					Interpersonal Skills		
Unit	Problem-solving	Critical Thinking/ Analysis	Decision-making	Effective Communication	Digital Literacy	Numeracy	Creativity	Plan Prioritise	Self-management	Independent learning	Self-reflection	Team work	Leadership	Cultural Awareness
13	X		X	X	X	X		X	X	X		X	X	
14	X	X	X	X	X			X	X	X	X			X

## Level 5 Higher National Diploma in Horticulture: mapping of transferable employability and academic study skills

Skill Sets	Cognitive skills						Intra-personal Skills					Interpersonal Skills		
Unit	Problem-solving	Critical Thinking/ Analysis	Decision-making	Effective Communication	Digital Literacy	Numeracy	Creativity	Plan Prioritise	Self-management	Independent learning	Self-reflection	Teamwork	Leadership	Cultural Awareness
15	X	X		X	X	X		X	X	X	X			
16	X	X	X	X	X	X	X	X	X	X	X	X	X	
17	X		X	X	X			X	X	X	X			X
18	X	X		X	X			X	X	X	X			X
19	X	X		X	X	X		X	X	X	X			X
20	X	X		X	X	X		X	X	X	X			X
21	X		X	X			X	X	X	X	X	X	X	X
22	X	X	X	X	X	X		X	X	X	X			X
23	X			X	X			X	X	X	X	X		X
24	X	X	X	X			X	X	X	X	X	X	X	X
25	X	X		X	X	X		X	X	X	X			X
26	X	X	X	X		X		X	X	X	X	X	X	X
27	X		X	X			X	X	X	X	X			X
28			X	X	X		X	X	X	X	X			X
29	X	X	X	X			X	X	X	X	X		X	X
30	X	X	X	X		X	X	X	X	X	X	X	X	X
31	X	X	X	X		X	X	X	X	X	X		X	X



Skill Sets	Cognitive skills						Intra-personal Skills					Interpersonal Skills		
Unit	Problem-solving	Critical Thinking/ Analysis	Decision-making	Effective Communication	Digital Literacy	Numeracy	Creativity	Plan Prioritise	Self-management	Independent learning	Self-reflection	Teamwork	Leadership	Cultural Awareness
32	X	X	X	X		X	X	X	X	X	X		X	X
33	X	X	X	X		X	X	X	X	X	X		X	X
34	X	X	X	X		X	X	X	X	X	X		X	X
35	X	X	X	X		X	X	X	X	X	X		X	X
36	X	X	X	X		X	X	X	X	X	X	X	X	X

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