Level 2 Certificate, Extended Certificate and Diploma in Sports and Amenity Turf Maintenance (0078-32)

www.cityandguilds.com
September 2017
Version 2.1

Qualification handbook for centres
500/8448/3
500/8865/8
500/8717/4

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Qualification title	Number	QAN
Level 2 Certificate in Sports and Amenity Turf Maintenance	0078-32	500/8448/3
Level 2 Extended Certificate in Sports and Amenity Turf Maintenance	0078-32	500/8865/8
Level 2 Diploma in Sports and Amenity Turf Maintenance	0078-32	500/8717/4

Version and date	Change detail	Section
V2.1 September 2017	• Added TQT and GLH details. • Removed QCF	Qualification at a glance Appendix 2, Guidance for delivery, unit summary

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Contents

1 Introduction to the qualifications

This document contains the information that centres need to offer the following qualifications:

Qualification title and level	GLH	TQT	City & Guilds qualification number	Qualification accreditation number
Level 2 Certificate in Sports and Amenity Turf Maintenance	90	150	0078-32	500/8448/3
Level 2 Extended Certificate in Sports and Amenity Turf Maintenance	180	300	0078-32	500/8865/8
Level 2 Diploma in Sports and Amenity Turf Maintenance	360	600	0078-32	500/8717/4

Qualification Summary

Qualification title and level	Credits	Guided Learning Hours (GLH)
Level 2 Certificate in Sports and Amenity Turf Maintenance	15	90
Level 2 Extended Certificate in Sports and Amenity Turf Maintenance	30	180
Level 2 Diploma in Sports and Amenity Turf Maintenance	60	360

These qualifications meet the needs of learners in a centre-based environment who may wish to work within the sports turf industry or progress to further learning and/or training. These qualifications allow learners to develop underpinning knowledge whilst practising skills that could be used within employment in the sports and amenity turf industry. These qualifications replace the Level 2 National Certificate in Sports and Amenity Turf Maintenance (0281-02) which expired on 31 July 2010 (QAN 500/1327/0).

These qualifications were developed in association with Lantra SSC, Landex and the industry.

Specialist Learning (SL)

Specialist Learning (SL) offers young people the opportunity to study a particular topic in more depth or broaden their studies through complementary learning. The Level 2 Certificate and Extended Certificate in Sports and Amenity Turf Maintenance have been approved as SL by the Environmental and Land-based Diploma DDP and Ofqual for the Higher Diploma in Environmental and Land-based Studies. They have been designed to:

- complement principal learning within the Higher Diploma in Environmental and Land-based Studies
- provide a broad background understanding of the Environmental and Land-based sector and an introduction to the practical skills and knowledge required
- provide an awareness of the range of jobs and work settings in the sports turf sector
- enable learners to make an informed assessment of their own aptitude for work in this sector and to make informed decisions about careers
- encourage learners to reach a level of knowledge and skills that will facilitate progress into further vocational learning or to potential employment in the sector
- introduce learners to the discipline of the working environment and to encourage mature attitudes to the community in general
- encourage learners to value continued learning and remain in the learning process
- allow learners to learn, develop and practise selected skills required for progression in the sector

- provide opportunities for progression to the Higher Diploma in Environmental and Land-based and other related qualifications in the sector.

1.1 Qualification structure

Level 2 Certificate

To achieve the **Level 2 Certificate in Sports and Amenity Turf Maintenance**, learners must achieve 5 credits from the Mandatory unit and a further 10 credits from any of the Optional units in the table below. A total of 15 credits are required to achieve the qualification.

Unit accreditation number	City & Guilds unit number	Unit title	Credit value	Excluded combination of units (if any)
Mandatory unit				
K6009594	221	Introduction to the Principles of Land-based Machinery	5	
Optional units				
T6010022	234	Maintain Sports Turf Surfaces - Cricket	10	
J6009957	235	Maintain Sports Turf Surfaces - Association Football	10	
F6009956	236	Maintain Sports Turf Surfaces – Golf	10	
L6009961	237	Maintain Sports Turf Surfaces – Horseracing	10	
L6009958	238	Maintain Sports Turf Surfaces -Bowling Greens	10	
Y6009963	239	Maintain Sports Turf Surfaces -Rugby Pitches	10	
H6009965	240	Maintain Sports Turf Surfaces –Tennis	10	
M6009967	241	Maintain Turf in Amenity Horticulture	10	
A6009972	242	Maintain Winter and Summer Sports Turf Surfaces	10	

Level 2 Extended Certificate

To achieve the **Level 2 Extended Certificate in Sports and Amenity Turf Maintenance**, learners must achieve 10 credits from any of the units in Optional group 1 and 20 credits from any of the units in Optional group 2. A total of 30 credits are required to achieve the qualification.

Unit accreditation number	City & Guilds unit number	Unit title	Credit value	Excluded combination of units (if any)
Optional group 1				
T6010022	234	Maintain Sports Turf Surfaces - Cricket	10	
J6009957	235	Maintain Sports Turf Surfaces - Association Football	10	
F6009956	236	Maintain Sports Turf Surfaces – Golf	10	
L6009961	237	Maintain Sports Turf Surfaces – Horseracing	10	
L6009958	238	Maintain Sports Turf Surfaces - Bowling Greens	10	
Y6009963	239	Maintain Sports Turf Surfaces - Rugby Pitches	10	
H6009965	240	Maintain Sports Turf Surfaces – Tennis	10	
M6009967	241	Maintain Turf in Amenity Horticulture	10	
A6009972	242	Maintain Winter and Summer Sports Turf Surfaces	10	

Optional group 2				
T6009808	201	Understand the Basic Principles of Plant Science	5	
H6009819	202	Understand the Basic Principles of Soil Science	5	
D6009978	219	Identification and Control of Plant Problems in the Land-based Sector	10	
T6009596	220	Introduction to Land-based Machinery Operations	10	
K6009594	221	Introduction to the Principles of Land-based Machinery	5	
D6009835	233	Tractor Driving	5	
T6010022	234	Maintain Sports Turf Surfaces - Cricket	10	
J6009957	235	Maintain Sports Turf Surfaces - Association Football	10	
F6009956	236	Maintain Sports Turf Surfaces - Golf	10	
L6009961	237	Maintain Sports Turf Surfaces - Horseracing	10	
L6009958	238	Maintain Sports Turf Surfaces - Bowling Greens	10	
Y6009963	239	Maintain Sports Turf Surfaces - Rugby Pitches	10	
H6009965	240	Maintain Sports Turf Surfaces - Tennis	10	
M6009967	241	Maintain Turf in Amenity Horticulture	10	

A6009972	242	Maintain Winter and Summer Sports Turf Surfaces	10	
K6009854	243	Understand the Principles of Sports and Amenity Turf Maintenance	10	
M6009953	244	Maintain and Renovate Artificial Sports Surfaces	10	

Level 2 Diploma

To achieve the **Level 2 Diploma in Sports and Amenity Turf Maintenance**, learners are required to achieve 40 credits from the Mandatory units, 10 credits from Optional Group 1 and 10 credits from Optional Group 2 in the table below. Learners are required to achieve a total of 60 credits to achieve the qualification.

Unit accreditation number	City & Guilds unit number	Unit title	Credit value	Excluded combination of units (if any)
Mandatory units				
T6009808	201	Understand the Basic Principles of Plant Science	5	
H6009819	202	Understand the Basic Principles of Soil Science	5	
H6009335	204	Undertake Work Related Experience in the Land-based Industries	10	
T6009596	220	Introduction to Land-based Machinery Operations	10	
K6009854	243	Understand the Principles of Sports and Amenity Turf Maintenance	10	
Optional Group 1				
T6010022	234	Maintain Sports Turf Surfaces – Cricket	10	
J6009957	235	Maintain Sports Turf Surfaces – Association Football	10	
F6009956	236	Maintain Sports Turf Surfaces – Golf	10	
L6009961	237	Maintain Sports Turf Surfaces – Horseracing	10	
L6009958	238	Maintain Sports Turf Surfaces – Bowling Greens	10	

Y6009963	239	Maintain Sports Turf Surfaces – Rugby Pitches	10	
H6009965	240	Maintain Sports Turf Surfaces – Tennis	10	
M6009967	241	Maintain Turf in Amenity Horticulture	10	
A6009972	242	Maintain Winter and Summer Sports Turf Surfaces	10	
Optional Group 2				
T6009968	205	Establish and Maintain Plants Outdoors	10	
Y6009364	213	Participate in Providing Estate Maintenance	10	
F6009357	214	Environmental and Land-based Business	10	
D6009978	219	Identification and Control of Plant Problems in the Land-based Sector	10	
K6009594	221	Introduction to the Principles of Land-based Machinery	5	
D6009835	233	Tractor Driving	5	
T6010022	234	Maintain Sports Turf Surfaces – Cricket	10	
J6009957	235	Maintain Sports Turf Surfaces – Association Football	10	
F6009956	236	Maintain Sports Turf Surfaces – Golf	10	
L6009961	237	Maintain Sports Turf Surfaces – Horseracing	10	

L6009958	238	Maintain Sports Turf Surfaces – Bowling Greens	10	
Y6009963	239	Maintain Sports Turf Surfaces – Rugby Pitches	10	
H6009965	240	Maintain Sports Turf Surfaces – Tennis	10	
M6009967	241	Maintain Turf in Amenity Horticulture	10	
A6009972	242	Maintain Winter and Summer Sports Turf Surfaces	10	
M6009953	244	Maintain and Renovate Artificial Sports Surfaces	10	

1.2 Opportunities for progression

On completion of these qualifications learners may progress into employment or to the following City & Guilds qualifications:

- Level 3 Certificate, Subsidiary Diploma and Extended Diploma in Sports and Amenity Turf Management
- Level 3 Award, Certificate and Diploma in Work-based Horticulture (Sports Turf)
- Other related qualifications

1.3 Qualification support materials

City & Guilds also provides the following publications and resources specifically for these qualifications:

Description	How to access
Assignment guide	www.cityandguilds.com
Marking guide	information@cityandguilds.com
Information sheets	www.cityandguilds.com
Fast track approval forms/generic fast track approval form	www.cityandguilds.com

2 Centre requirements

This section outlines the approval processes for Centres to offer these qualifications and any resources that Centres will need in place to offer the qualifications including qualification-specific requirements for Centre staff.

Centres already offering the Level 2 National Certificate in Sports and Amenity Turf Maintenance (0281-02)

Centres approved to offer the Level 2 National Certificate in Sports and Amenity Turf Maintenance (0281-02) may apply for approval for the new Level 2 Certificate, Extended Certificate and Diploma in Sports and Amenity Turf Maintenance using the **fast track approval form**, available from the website.

Centres may apply to offer the new qualifications using the fast track form

- providing there have been no changes to the way the qualifications are delivered, and
- if they meet all of the approval criteria specified in the fast track form guidance notes.

Fast track approval is available for 12 months from the launch of the qualification. After this time, the qualification is subject to the **standard** Qualification Approval Process. It is the centre's responsibility to check that fast track approval is still current at the time of application.

New centres must apply for centre and qualification approval. Further information on this process is available on the City & guilds website.

Existing City & Guilds centres that do not offer Level 2 National Certificate in Sports and Amenity Turf Maintenance (0281-02) will need to get specific qualification approval to run these qualifications (contact your City & Guilds Local Office).

2.1 Resource requirements

Human resources

Staff delivering these qualifications must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be technically competent in the areas for which they are delivering training and/or have experience of providing training. This knowledge must be at least to the same level as the training being delivered
- have recent relevant experience in the specific area they will be assessing
- be occupationally knowledgeable in the area(s) of sports and amenity turf maintenance for which they are delivering training. This knowledge must be at least to the same level as the training being delivered
- have credible experience of providing training.

Centre staff may undertake more than one role, e.g. tutor and assessor or internal verifier, but must never internally verify their own assessments.

Assessors and internal verifiers

The centre must provide Assessor personnel who must be occupationally competent in the industry either qualified to at least level 2 and/or have current experience of working in the industry at this level.

The centre must provide Internal Quality Assurance personnel who must be occupationally competent in the land-based sector either qualified to at least level 2 and/or have current experience of working in the industry at this level.

Assessors/Internal Quality Assurance personnel may hold relevant qualifications such as D32/33/34 or A1/V1 or TAQA however they are not a mandatory requirement for this qualification. They should have had formal training in assessment/IQA, which may be the qualifications above, or other training that allows the assessor

to demonstrate competence in the practice of assessment/IQA. This training may be carried out in-house or with an external agency.

TAQA qualifications are considered very appropriate as Continuing Professional Development (CPD) or as best practice standards for new centre staff to work towards.

Continuing professional development (CPD)

Centres are expected to support their staff in ensuring that their knowledge remains current of the occupational area and of best practice in delivery, mentoring, training, assessment and verification, and that it takes account of any national or legislative developments.

2.2 Learner entry requirements

There are no formal entry requirements for learners undertaking these qualifications. However, centres must ensure that learners have the potential and opportunity to gain the qualifications successfully.

As part of the assessment for the Level 2 Diploma qualification, learners must have access to a work setting/placement for the work experience unit.

2.3 Age restrictions

These qualifications have been approved/accredited for learners aged pre-16, 16-18, 18+ and 19+ learners. However, there are no age limits attached to learners undertaking the qualification unless this is a legal requirement of the process or the environment.

3 Course design and delivery

3.1 Initial assessment and induction

Centres will need to make an initial assessment of each learner prior to the start of their programme to ensure they are entered for an appropriate type and level of qualification.

The initial assessment should identify:

- any specific training needs the learner has, and the support and guidance they may require when working towards their qualifications. This is sometimes referred to as diagnostic testing
- any units the learner has already completed, or credit they have accumulated which is relevant to the qualifications they are about to begin.

City & Guilds recommends that centres provide an induction programme to ensure the learner fully understands the requirements of the qualifications they will work towards, their responsibilities as a learner, and the responsibilities of the centre. It may be helpful to record the information on a learning contract.

3.2 Recommended delivery strategies

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualifications before designing a course programme.

Centres may design course programmes of study in any way which:

- best meets the needs and capabilities of their learners
- satisfies the requirements of the qualifications.

When designing and delivering the course programme, centres might wish to incorporate other teaching and learning that is not assessed as part of the qualifications. This might include the following:

- Functional skills
- Personal learning and thinking skills (PLTS)

Where applicable, this could involve enabling the s to access relevant qualifications covering these skills.

4 Assessment

4.1 Summary of assessment methods

For these qualifications, learners will be required to complete the following assessments:

- **one** assignment for **each** unit

City & Guilds provides the following assessments:

- Assignment guide containing assignments for each unit.

Time constraints

The following time constraints must be applied to the assessment of these qualifications:

- All assignments must be completed and assessed within the learner's period of registration. Centres should advise learners of any internal timescales for the completion and marking of individual assignments.

4.2 Assignments

The assignment guide for these qualifications is available to download from **www.cityandguilds.com.**

4.3 Recognition of prior learning (RPL)

Recognition of Prior Learning (RPL) recognises the contribution a person's previous experience could contribute to a qualification. RPL is allowed and is also sector specific.

4.4 Resubmission of Assignments

Centres are advised to adopt the following policy on the re-submission of work:

Learners who fail an assignment on the formal (summative) submission, or who would like the opportunity to improve their grade, may re-submit once only and may then achieve either a Pass, Merit or Distinction as appropriate. An appropriate time period between formal submission and re-submission should be set by the centre. Multiple re-submissions are not permitted. Learners who fail to hand in work on the formal submission date, where there is no legitimate reason, should be capped to a maximum of a Pass grade only at the re-submission stage. It is at the discretion of the centre to set informal (formative) submission dates, if appropriate, and a formal submission date.

5 Units

Summary of units

City & Guilds unit number	Title	Unit number	Credits
201	Understand the Basic Principles of Plant Science	T6009808	5
202	Understand the Basic Principles of Soil Science	H6009819	5
204	Undertake Work Related Experience in the Land-based Industries	H6009335	10
205	Establish and Maintain Plants Outdoors	T6009968	10
213	Participate in Providing Estate Maintenance	Y6009364	10
214	Environmental and Land-based Business	F6009357	10
219	Identification and Control of Plant Problems in the Land-based Sector	D6009978	10
220	Introduction to Land-based Machinery Operations	T6009596	10
221	Introduction to Principles of Land-Based Machinery	K6009594	5
233	Tractor Driving	D6009835	5
234	Maintain Sports Turf Surfaces - Cricket	T6010022	10
235	Maintain Sports Turf Surfaces - Association Football	J6009957	10
236	Maintain Sports Turf Surfaces - Golf	F6009956	10
237	Maintain Sports Turf Surfaces - Horseracing	L6009961	10
238	Maintain Sports Turf Surfaces - Bowling Greens	L6009958	10
239	Maintain Sports Turf Surfaces - Rugby Pitches	Y6009963	10
240	Maintain Sports Turf Surfaces -Tennis	H6009965	10
241	Maintain Turf in Amenity Horticulture	M6009967	10
242	Maintain Winter and Summer Sports Turf Surfaces	A6009972	10
243	Understanding the Principles of Sports and Amenity Turf Maintenance	K6009854	10
244	Maintain and Renovate Artificial Sports Surfaces	M6009953	5

Certification/grading modules

City & Guilds unit number	Title
922	Certification module for Level 2 Certificate in Sports and Amenity Turf Maintenance - pass grade
923	Certification module for Level 2 Certificate in Sports and Amenity Turf Maintenance - merit grade
924	Certification module for Level 2 Certificate in Sports and Amenity Turf Maintenance - distinction grade
925	Certification module for Level 2 Extended Certificate in Sports and Amenity Turf Maintenance - pass grade
926	Certification module for Level 2 Extended Certificate in Sports and Amenity Turf Maintenance - merit grade
927	Certification module for Level 2 Extended Certificate in Sports and Amenity Turf Maintenance - distinction grade
928	Certification module for Level 2 Diploma in Sports and Amenity Turf Maintenance - pass grade
929	Certification module for Level 2 Diploma in Sports and Amenity Turf Maintenance - merit grade
930	Certification module for Level 2 Diploma in Sports and Amenity Turf Maintenance - distinction grade
946	Certification module for Level 2 Certificate in Sports and Amenity Turf Maintenance – distinction * grade
947	Certification module for Level 2 Extended Certificate in Sports and Amenity Turf Maintenance – distinction* grade
948	Certification module for Level 2 Diploma in Sports and Amenity Turf Maintenance – distinction* grade

6 Registration and Certification

The Level 2 Certificate, Extended Certificate and Diploma in Sports and Amenity Turf Maintenance qualifications have been grouped into one programme for registration.

Tutors and Examination Officers should ensure that learners are registered onto 0078-32 and that all 0078-32 documentation for teaching and administration with City & Guilds is used.

When learners' results are submitted to City & Guilds, centres should also submit the relevant Certificate, Extended Certificate and Diploma component, according to which units the learner has achieved, so that the appropriate certificate is generated. The overall grade can be calculated using the formula in the assignment guide.

Please note: There are four certification/grading modules for each of the qualifications which differentiates the four grades – pass, merit, distinction and distinction*. Once the overall grade for the assignments has been calculated, the correct certification/grading module needs to be indicated on the results entry.

For example, if a learner achieves the Level 3 Certificate in Sports and Amenity Turf Maintenance at an overall merit grade, then the certification module 923 needs to be submitted. Please see the Rules of Combination below or the City & Guilds catalogue.

Level 2 Certificate in Sports and Amenity Turf Maintenance QAN 500/8448/3	
Rules for achievement of qualification	5 credits from 221 plus a minimum of 10 credits from (234-242) Plus 922 for certification at pass grade

Level 2 Certificate in Sports and Amenity Turf Maintenance QAN 500/8448/3	
Rules for achievement of qualification	5 credits from 221 plus a minimum of 10 credits from (234-242) Plus 923 for certification at merit grade

Level 2 Certificate in Sports and Amenity Turf Maintenance QAN 500/8448/3	
Rules for achievement of qualification	5 credits from 221 plus a minimum of 10 credits from (234-242) Plus 924 for certification at distinction grade

Level 2 Certificate in Sports and Amenity Turf Maintenance QAN 500/8448/3	
Rules for achievement of qualification	5 credits from 221 plus a minimum of 10 credits from (234-242) Plus 943 for certification at distinction* grade

Level 2 Extended Certificate in Sports and Amenity Turf Maintenance QAN 500/8865/8	
Rules for achievement of qualification	10 credits from (234-242), plus 20 credits from (201-202), (219-221), (233-244) Plus 925 for certification at pass grade

Level 2 Extended Certificate in Sports and Amenity Turf Maintenance QAN 500/8865/8	
Rules for achievement of qualification	10 credits from (234-242), plus 20 credits from (201-202), (219-221), (233-244) Plus 926 for certification at merit grade

Level 2 Extended Certificate in Sports and Amenity Turf Maintenance QAN 500/8865/8	
Rules for achievement of qualification	10 credits from (234-242), plus 20 credits from (201-202), (219-221), (233-244) Plus 927 for certification at distinction grade

Level 2 Extended Certificate in Sports and Amenity Turf Maintenance QAN 500/8865/8	
Rules for achievement of qualification	10 credits from (234-242), plus 20 credits from (201-202), (219-221), (233-244) Plus 947 for certification at distinction* grade

Level 2 Diploma in Sports and Amenity Turf Maintenance QAN 500/8717/4	
Rules for achievement of qualification	40 credits from (201-202), 204, 220, 243 plus a minimum of 10 credits from(234-242) plus a minimum of 10 credits from 205, (213-214), 219, 221, (233-242), 244 Plus 928 for certification at pass grade

Level 2 Diploma in Sports and Amenity Turf Maintenance QAN 500/8717/4	
Rules for achievement of qualification	40 credits from (201-202), 204, 220, 243 plus a minimum of 10 credits from(234-242) plus a minimum of 10 credits from 205, (213-214), 219, 221, (233-242), 244 Plus 929 for certification at merit grade

Level 2 Diploma in Sports and Amenity Turf Maintenance QAN 500/8717/4	
Rules for achievement of qualification	40 credits from (201-202), 204, 220, 243 plus a minimum of 10 credits from(234-242) plus a minimum of 10 credits from 205, (213-214), 219, 221, (233-242), 244 Plus 930 for certification at distinction grade

Level 2 Diploma in Sports and Amenity Turf Maintenance QAN 500/8717/4	
Rules for achievement of qualification	40 credits from (201-202), 204, 220, 243 plus a minimum of 10 credits from(234-242) plus a minimum of 10 credits from 205, (213-214), 219, 221, (233-242), 244 Plus 948 for certification at distinction* grade

- Learners must be registered at the beginning of their course. Centres should submit registrations using Walled Garden or Form S (Registration), under scheme/complex 0078-32.

- When assignments have been successfully completed results should be submitted on Walled Garden or Form S (Results submission). One of the certification/grading modules 922 to 930 or 946 to 948 need to be submitted to generate the appropriate certificate and grade. Centres should note that results will not be processed by City & Guilds until verification records are complete.

- Learners achieving one or more assessment components will receive a Certificate of Unit Credit listing the assessment components achieved. Learners achieving the number and combination of assessment components required to meet a defined Rule of Combination will, in addition, be issued with a certificate. Centres must submit a certification/grading component to allow this to happen.

Full details on the procedures for all City & Guilds qualifications registered and certificated through City & Guilds can be found on the City & Guilds on-line catalogue.

Unit 201 Understand the Basic Principles of Plant Science

Level: 2

Credit value: 5

Unit aim

This unit aims to provide learners with an understanding of the basic principles of plant science. It is unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop knowledge relating to the structure of plants by identifying their external features, develop an understanding of how plants function. They will also develop an understanding of the development and physiology of plants, inclusive of growth and development, plant processes, reproduction, life cycles and stages.

Learning outcomes

There are **two** learning outcomes to this unit. The learner will:

1. Know the physical structure of plants
2. Understand the development and physiology of plants

Guided learning hours

It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

n/a

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 201 Understand the Basic Principles of Plant Science

Outcome 1 Know the physical structure of plants

Assessment Criteria

The learner can:

1. Identify the **organs of plants**
2. Describe the main **tissues of plants**
3. Identify the **functions of** leaves, stems, roots and flowers

Unit content

Organs of plants

Roots (fibrous, tap and tuberous), leaves (petiole, lamina, midrib, veins), cotyledons, stems (woody and non-woody), buds, flowers (petals, sepals, anthers, filament, style, stigma, ovary, bract)

Tissues of plants

Main tissues of stems, roots and leaves, inclusive of cell structure, vascular tissues, xylem, phloem and cambium, root hairs: stomata and guard cells, cuticle, epidermis and endodermis

Functions

Leaves: produce food by photosynthesis, carry out transpiration, natural vegetative reproduction i.e. foliar embryos
Stems: provide support for the leaves, flowers and fruit, provide a transport system around the plant for water, nutrients and food, on occasions have a climbing and protective function
Roots: anchor the plant in the soil, absorb water and nutrients from the soil, food storage and reproduction
Flowers: pollination, fertilisation and seed and fruit formation

Unit 201 Understand the Basic Principles of Plant Science

Outcome 2 Understand the development and physiology of plants

Assessment Criteria

The learner can:

1. Summarise the **processes involved in growth and development**
2. Summarise the **processes involved in plant reproduction**
3. Define the terms **ephemeral, annual, biennial, perennial** as they relate to plant life cycles
4. Describe the characteristics of **stages of plant growth**

Unit content

Processes involved in growth and development

Photosynthesis, respiration, osmosis, transpiration and translocation: definitions and descriptions/ use simple formulae, tropisms, environmental factors affecting each process, including light, dark, water, temperature, nutrient, carbon dioxide and oxygen

Processes involved in plant reproduction

Sexual reproduction (pollination, fertilisation) stages of seed germination and types (epigeal and hypogeal), environmental requirements for successful germination (moisture, warmth etc), asexual reproduction by natural vegetative means e.g. corms, bulbs, tubers and stolons

Ephemeral, annual, biennial, perennial

Definition as they relate to plant life cycles

Stages of plant growth

Juvenile, adult, senescent

Unit 201 Understand the Basic Principles of Plant Science

Notes for guidance

The learner will be able to develop the knowledge required to understand how plants function, reproduce, grow and develop. The unit presents an opportunity for learners to consider factors which influence plant production and growth and provides supporting knowledge, understanding and decision making skills necessary for units/subjects associated with propagation, crop production, planting and aftercare.

In Outcome 1, learners develop knowledge of plant structures. They should be able to describe the external structure of plants and the function of tissues within the plant. Though not essential, it would be helpful to introduce them to the internal structure of plants in the laboratory.

In Outcome 2, learners will develop knowledge of the physiological processes that take place in the plant, including photosynthesis, respiration, osmosis, transpiration and translocation. They should appreciate the effects of environmental factors on each of these, both in terms of excesses and deficiencies and then be able to apply this knowledge to horticultural situations, including propagating plants by seed and vegetative means, growing on, planting, weed control and harvesting.

The unit may be delivered by a wide range of techniques, including lectures, supervised practical work, experimentation, investigations using microscope slides and sections, discussions, video, site visits and research. The delivery of this unit may be integrated with the delivery of other units where this is feasible and every opportunity should be taken to show how the knowledge acquired in this unit may be applied to practical horticultural tasks. All methods should reinforce the importance of health and safety and environmental issues. Risk assessments must be undertaken prior to practical activities.

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Unit 202 Understand the Basic Principles of Soil Science

Level: 2

Credit value: 5

Unit aim

This unit aims to provide learners with an understanding of the basic principles of soil science. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop the knowledge required to understand the physical and chemical properties of soils and relate this to the growth of plants in the wild and in cultivation. They will also develop the skills to assess soils in order to inform soil management decisions, including the selection of appropriate fertilisers in order to encourage the desired plant growth.

Learning outcomes

There are **three** learning outcomes to this unit. The learner will:

1. Be able to assess the physical and chemical characteristics of soils
2. Understand the physical properties of soils
3. Understand the chemical properties of soils and fertilisers

Guided learning hours

It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

There are no relevant NOS for this unit

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 202 Understand the Basic Principles of Soil Science

Outcome 1 Be able to assess the physical and chemical characteristics of soils

Assessment Criteria

The learner can:

1. Identify the **horizons in a soil profile**
2. Analyse samples of soil to determine:
   - **textural class**
   - **pH**

Unit content

Horizons in a soil profile

Organic layer, top-soil, sub-soil, parent material
O - organic layer, A - topsoil, B - subsoil, C – (parent material) bedrock, winter water table, drainage characteristics
Soil profile pit, extending to sufficient depth to expose soil profiles O, A, B, and C

Textural class

Components of soils, clay, silt, sand, loam; use of field and laboratory textural analysis methods

pH

Soils: neutral, acid, alkali
Collection and preparation of samples: testing with a colorimetric testing kit to determine relative alkalinity/acidity

Unit 202 Understand the Basic Principles of Soil Science

Outcome 2 Understand the chemical properties of soils and fertilisers

Assessment Criteria

The learner can:

1. Describe the **formation, characteristics, texture and component parts of soils**
2. Explain how soil structure and the balance of soil air and water affect the **growth of plants**
3. Explain **factors relating to soil water;** sources, availability, effects on various soil types and terms associated with the water balance
4. Explain how organic matter and soil organisms contribute to **soil structure and fertility**

Unit content

Formation

Weathering agents, transporting agent, parent material, bedrock
Definition of soil structure and soil texture

Characteristics, texture and component parts of soils

Sandy, loam, clay and organic soils
Components: sand, gravel, loam, clay, organic matter, soil organisms, air and water, importance of air in the soil, contribution of soil organisms to fertility

Growth of plants

Individual components of soils, anchorage, balance and availability of soil air, water and nutrients, drainage, soil temperature, compaction/aeration, workability of soils

Factors relating to soil water

Sources, availability, effects on various soil types and terms associated with the water balance
Definition of: saturation, soil moisture deficit, permanent wilting point, available and unavailable water, field capacity, capillary, gravitational water, water table, drainage and irrigation
Water-holding capacity of sands, silts, clays and organic soil

Soil structure and fertility

Organic matter/humus content, amount of decay, diversity and quantity of soil organisms (invertebrates, vertebrates, fungi, bacteria), contributions made by each

Unit 202 Understand the Basic Principles of Soil Science

Outcome 3 Understand the chemical properties of soils and fertilisers

Assessment Criteria

The learner can:

1. State the **nutrient** requirements of plants and their individual effects on growth:
   - **Micro-nutrients**
   - **Macro-nutrients**
2. State the typical symptoms of nutrient deficiencies in plants:
   - **Micro-nutrients**
   - **Macro-nutrients**
3. Explain **how pH affects plant growth** and methods of adjusting the pH to meet specific requirements
4. Explain the principles of cation and anion **exchange capacity** in the soil and their relationship to texture and organic matter
5. Explain the **categories** and terminology **used to describe fertilisers**
6. **Define the terms** Plant Nutrient Ratio and Nutrient Weight Analysis.

Unit content

Nutrient

Nitrogen, phosphorus and potassium, requirements for growth and photosynthesis, growth stage requirements, availability, uptake and interaction

Micro-nutrients

Functions of : Copper, Sodium, Zinc, Iron, Boron, Manganese, Molybdenum
Main fertilisers and their nutrient content relating to a specific sector of horticulture

Macro-nutrients

Functions of primary (Nitrogen, Phosphorus, Potassium) and secondary (Magnesium, Calcium, Sulphur)
Main fertilisers and their nutrient content relating to a specific sector of horticulture

How pH affects plant growth

Availability of nutrients, specific nutritional disorders related to pH, calcicole and calcifuge, lowering and raising the pH, relationship between plat nutrition and development

Exchange capacity

Cation (positive charged ion), anion (negatively charge ion), nutrient/chemical reactions
Exchange of cations held by soil, effect on nutrient uptake, soils capacity to hold nutrients, Cation Exchange Capacity (CEC) determined by amount of clay/humus a soil contains, a measure of soils fertility, role of soil water, texture, organic matter, content of soils

Categories used to describe fertilisers

Straight, mixture, compound, complete, inorganic, organic, controlled release, granules, liquid, solid, prill, pelleted

Define the terms

Plant Nutrient Ratio and Nutrient Weight Analysis, nutrient content of packaged fertilisers
Nutrient balance, competition between nutrients for uptake, nutrient content/quantities of feeds/fertilisers

Unit 202 Understand the Basic Principles of Soil Science

Notes for guidance

The learner will be able to develop the knowledge required to understand the physical and chemical properties of soils and relate this to the growth of plants in the wild and in cultivation. They will also develop the skills to assess soils in order to inform soil management decisions.

In Outcome 1, learners will develop skills in assessing the physical and chemical properties of soils. They will require access to suitable laboratory facilities for this. Laboratory and field methods should be practised, including collection of soil samples, soil textural analysis in the hand by the 'feel method' (range to include sand, silt, clay and loam) and pH determination using the colorimetric method. Learners will be required to dig a soil profile pit, record and examine the four main horizons and characteristics of the soil.

In Outcome 2, learners will develop an understanding of the physical aspects of soils, including soil formation, soil constituents, texture and structure, pore space, soil water and soil air and factors affecting the health of the plant, including how organic matter and soil organisms contribute to soil structure and fertility. Learners will be required to explain how the structure of a given soil, including its balance of air, water, organic matter, organisms and nutrient availability may affect the growth of plants.

In Outcome 3, learners will further develop their understanding of the chemical aspects of soils, including being able to name the main macronutrients and micronutrients and their individual effects on plant growth. Learners will be able to explain the basic principles of cation and anion exchange, relating that knowledge to the plants potential for growth and development. They will know how the pH of a soil or growing media affects plant growth, including nutritional disorders and the categorisation of plants into the calcifuges and calcicole groups. Knowledge of the categories to describe fertilisers will enhance the learner's ability to select the appropriate feed and method of application. The ability to interpret nutrient content of packaged fertilisers will assist the learner in making informed decisions regarding choice of feeds to encourage desired plant growth.

The unit may be delivered by a wide range of techniques, including lectures, supervised practical work, experimentation, investigations using microscope slides and sections, discussions, video, site visits and research. The delivery of this unit may be integrated with the delivery of other units where this is feasible and every opportunity should be taken to show how the knowledge acquired in this unit may be applied to practical horticultural tasks. All methods should reinforce the importance of health and safety and environmental issues. Risk assessments must be undertaken prior to practical activities.

References

Books

Adams CR. 2008. *Principles of Horticulture*. Oxford: Butterworth-Heinemann ISBN: 9-780-75068-694-5.

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Unit 204 Undertake Work Related Experience in the Land-based Industries

Level: 2

Credit value: 10

Unit aim

The aim of this unit is to give learners the skills needed to identify, participate in and review work experience in a land-based environment. The unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know the range and scope of job roles within an environmental and land-based industry
2. Be able to use relevant documents and skills relating to work experience
3. Be able to plan and review self development during work experience
4. Be able to report on the work experience

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

n/a

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 204 Undertake Work Related Experience in the Land-based Industries

Outcome 1 Know the range and scope of job roles within an environmental and land-based industry

Assessment Criteria

The learner can:

1. Describe different **types of jobs** within an environmental and land-based industry
2. Describe the **skills and qualifications** required for different types of jobs within an environmental and land-based industry

Unit content

Types of jobs

Types of jobs relevant to the industry: managerial, supervisory, team worker, trainee, volunteer, common job titles within the relevant industry, main duties and responsibilities

Skills needed to fulfil duties and responsibilities of appropriate jobs: job specific, vocational and personal

Skills and qualifications

Types of qualifications available to the industry, e.g. GCSE and A level, the Diploma(including Functional Skills), Apprenticeships (including Work-based Learning qualifications), Foundation Learning (Entry Level and Level 1), standalone/industry specific vocational, e.g. Centre-based (City & Guilds, Edexcel and others), practical competence based e.g. Certificates of Competence, other

Progression pathways from trainee or team worker positions to supervisory and management posts. Skills, qualifications and experience required to achieve career progression

Evaluate career and progression opportunities: advantages and disadvantages of identified pathways, suitability to personal interests, skills and qualifications, role of work experience in preparing for a selected career

Skills valued by employers: commitment and reliability, time management, people skills, confidentiality and discretion

Unit 204 Undertake Work Related Experience in the Land-based Industries

Outcome 2 Be able to use relevant documents and skills relating to work experience

Assessment Criteria

The learner can:

1. Locate three advertisements for jobs from **different sources** available within the environmental and land-based industry
2. Produce an **application** for work experience in the environmental and land-based sector
3. **Prepare for an interview** for work experience
4. **Undertake an interview** for work experience

Unit content

Different sources

Locate three advertisements from for example trade magazines, websites, employer approaches to the centre, local paper, Countryside Jobs Service

Application

Suitable work experience position based on existing skills, experience, qualifications, development of skills and experience to achieve future employment goals
Personal details, education and training, professional membership, training, employment history, qualifications held, skills and general information, declarations

Prepare for an interview

Interview preparation: research the business and job role, suitable dress and personal presentation, information to find out and suitable questions to ask

Undertake an interview

Interview performance: attend punctually and dressed appropriately, answering questions, completion of other tests (e.g. practical, aptitude), and reflection on interview performance

Unit 204 Undertake Work Related Experience in the Land-based Industries

Outcome 3 Be able to plan and review self development during work experience

Assessment Criteria

The learner can:

1. **Review own skills and experience** against the requirements for a specific industry
2. Prepare a **self development plan** for work experience
3. **Review** self development plan during and after work experience

Unit content

Review own skills and experience

Current skills and experience compared with those required for the job, identify training and development needs

Self development plan

New skills, knowledge, understanding, experience, development of existing knowledge and skills, training needed

Review

Skills, knowledge, understanding and experience that have been developed during work experience, impact on technical ability to perform the job role, work as a member of a team, future employability, future employment ambitions, further training and development

Unit 204 Undertake Work Related Experience in the Land-based Industries

Outcome 4 Be able to report on the work experience

Assessment Criteria

The learner can:

1. **Gather and prepare evidence** during the work experience
2. **Present information** to others on work experience

Unit content

Gather and prepare evidence

Position within the organisation structure, job description of work role, working practices, health and safety, daily work routine, diary of work activities, report from work experience provider

Present information

Written or oral report on the work experience, name of work experience provider, nature of the organisation (type of business, products or services), job role, health and safety, skills and knowledge developed

Unit 204 Undertake Work Related Experience in the Land-based Industries

Notes for guidance

Learners on centre-based courses should have experience of the type of work that they hope to do and of the expectations of potential future employers. Some level 2 learners are likely to already have experience of working in the land-based and environmental industries, so this unit seeks to provide new experience opportunities for these learners.

This unit should be undertaken in a real business environment relevant to the subject interest of the learner but work experience may be gained by a number of routes, e.g. as part of an industrial placement whilst within the programme, whilst working on a planned daily or weekly basis on the centre's commercial and/or educational facilities, whilst undertaking voluntary work within the industry, or as a member of a group of learners invited to carry out practical work on a suitable business.

Any Act or legislation that is sector specific should be adhered to. This includes duty of care if working with animals.

Learners should complete the equivalent of 4 weeks (or 150 hours) work experience to achieve this unit. Centres should be mindful of their responsibilities for ensuring that work placements have appropriate supervision, insurance and health and safety policies in place and that learners have access to appropriate support whilst on placement.

In Outcome 1, learners will explore the different job roles, responsibilities and job titles commonly associated with them in their specialist sector. This background understanding is likely to require some classroom teaching but learners should be encouraged to explore the range of employment opportunities within their specialist sector. It would be appropriate for employers to be invited to outline to learners their expectations in the workplace. Learners will be required to consider the skills and qualifications that are required for appropriate jobs, and should be encouraged to think about the skills and qualifications that they may need to acquire to achieve their employment ambitions. This should also help them to identify a suitable work experience placement.

Outcome 2 involves learners undertaking the process of applying for work experience. They will need to locate suitable job adverts but can be supported by centres suggesting suitable placements. When applying for work experience learners should produce, as a minimum, a detailed curriculum vitae and letter of application using a computer. Learners may need to be given supported workshop time on computers to develop these documents. Before attending a work experience interview, it would be appropriate for learners to role play an interview and be given feedback on their interview technique. After attending an interview, they should reflect on their performance and how they could improve their effectiveness.

In Outcome 3, learners will review their existing skills, knowledge and experience against those required for a specific job role and how they will seek to develop these during the work experience. This development will be reviewed at a mid-point during the work experience and at the end, when they will reflect on how the work experience has helped to develop their future employability in line with their employment ambitions. Whilst learners are on work experience, and especially if this is an extended placement away from the centre, it is important that they have access to and support available from tutors.

Outcome 4 requires learners to gather basic evidence on their work experience, including the organisation name, main products or services, organisation staffing structure and their role within the organisation. The learner does not need to keep a diary of all duties undertaken each day but should produce a detailed description of the usual work routine and supplement this with a diary of any additional tasks, events, activities or items that represent learning opportunities. They should also note how health and safety of staff

and, if relevant, customers is managed in the workplace. A feedback report from the work experience provider will form part of the evidence for this outcome. The final report on work experience could be presented in written form or as a presentation to tutors and other learners. As a minimum, it should include the range listed. It would be appropriate to include the final review and reflection on work experience from Outcome 3 in this report.

Unit 205 Establish and Maintain Plants Outdoors

Level: **2**

Credit value: **10**

Unit aim

This unit aims to provide learners with an understanding of how to establish and maintain plants outdoors, and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or to further education and training.

The learner will be able to prepare ground and plants and maintain woody and herbaceous plants outdoors, promoting establishment and healthy development.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to prepare ground to receive plants
2. Be able to plant woody and herbaceous plants
3. Be able to maintain the health of plants outdoors
4. Know how to maintain the health of plants outdoors

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

L2 Establish plants outdoors
PH3.3 Maintain plant development
CU76.1 Maintain the health of plants outdoors

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 205 Establish and Maintain Plants Outdoors

Outcome 1 Be able to prepare ground to receive plants

Assessment Criteria

The learner can:

1. Assess a site to determine the **preparation** required and **identify hazards**
2. **Prepare land** for planting safely by hand cultivation methods
3. Prepare land for planting **safely using pedestrian operated machines**
4. Explain how **tilth, soil structure, depth of preparation and seasonality and timing of cultivations** affect the establishment of plants

Unit content

Preparation

Basic site analysis carried out to determine the ground preparation required: this should include identifying the need for and requirement of initial site clearance of unwanted plant material and general debris. Determine soil type e.g. clay loam, sandy loam, to ascertain preparation techniques and soil improvement needs. Soil texture, structure, pH and ground conditions of the planting site should be ascertained to influence decision making process

Identify hazards

Permanent hazards such as overhead power lines and underground services, access routes, machine related hazards
Check for temporary/site specific hazards, such as those brought on by inclement weather and possible site contamination. Site hazards to be identified for the avoidance of planting and establishment problems and to ensure safe working

Prepare land

Primary and secondary hand cultivation, weed control and removal, single and double digging as appropriate raking, treading, levelling and tilth production, soil amelioration, incorporation of organic matter and application of appropriate fertilisers

Safely using pedestrian operated machines

The learner is required to demonstrate the use of pedestrian operated machines (rotary cultivator) for secondary cultivation, in a safe and appropriate manner, adhering to manufacturer's instructions

Tilth, soil structure, depth of preparation and seasonality and timing of cultivations

Explanation of the effect of these on the establishment of plants
Methods of tilth production and consolidation
Effects of soil type, structure, drainage and condition on site preparation methods
Potential health and safety concerns inherent in site preparation and planting on outdoor sites

Unit 205 Establish and Maintain Plants Outdoors

Outcome 2 Be able to plant woody and herbaceous plants

Assessment Criteria

The learner can:

1. Select plant material in an **appropriate condition** for planting
2. Plant a range of **woody and herbaceous** plants
3. Provide **immediate aftercare** for new plantings
4. Explain why **planting depth and firming** have a significant affect on establishment

Unit content

Appropriate condition

Moist roots/root-ball, free from pests and diseases, physical damage, containerised and container grown plants, firm in the pot but not root-bound, correct size /even grade/ typical features (reference to British Standards – Nursery Stock categories)

Woody and herbaceous

Trees and shrubs, herbaceous perennials and seasonal bedding, depth of cultivation/planting, correct techniques used (pit planting, supporting/staking) and required firming for different plant types, application of appropriate fertiliser to aid establishment if required
Possible planting through weed suppressant geotextile material

Immediate aftercare

Watering, supporting/staking, mulching, labelling, weed control as appropriate to requirements, soil conditions and time of year

Planting depth and firming

Techniques and benefits to be identified e.g. are tree/shrubs planted at same depth as in nursery, keep top soil separate from sub soil when taking out planting pit, top soil to be returned around the roots first, firm soil around plants to ensure roots are in contact with the surrounding soil, firming also helps to secure plant in the ground, graft union to finish above ground level, planting too shallowly may result in weak and unstable plant, (depends on type) prone to drying out, firm planting also may prevent birds disturbing/loosening small plants

Unit 205 Establish and Maintain Plants Outdoors

Outcome 3 Be able to maintain the health of plants outdoors

Assessment Criteria

The learner can:

1. **Maintain plants** in a way which complies with environmental and health and safety legislation and codes of practice
2. Identify a range of **threats** to plant health:
   - pests
   - diseases
   - disorders
   - unfavourable conditions
   - weeds
3. Promote and maintain **healthy growth** using all of the following methods:
   - feeding
   - watering
   - surface cultivation
   - mulching
4. **Prune plants** using appropriate techniques, according to species, time of year, stage of development.

Unit content

Maintain plants

Ensure maintenance complies with environmental and health and safety legislation and codes of practice: removal and dispose of debris in an environmentally responsible way; avoidance of chemical spray drift; avoidance of damage to site and plant material
Legislation includes Food and Environment Protection Act 1990 (as amended 1995) (FEPA), Control of Substances Hazardous to Health Regulations (2002) (COSHH), Health and Safety at Work etc Act (1974)

Threats

Named pests, diseases, disorders unfavourable weather conditions (drought, wet conditions, frost, high winds) and weeds as relevant to the area of study; relevant legislation

Healthy growth

At least, feeding, watering, surface cultivation and mulching must be covered, but other specific operations should be covered as relevant to the plants being maintained e.g. fertiliser application, pest and disease control and prevention

Prune plants

Shrubs: flowering on current season's growth, flowering on previous season's growth and those grown for winter stems and summer foliage, using clean secateurs and pruning saws as appropriate
Trees: removal of small branches from the ground with non-powered equipment (pruning saws)
Hedges: annual pruning, formal and informal, using secateurs and powered hedge trimmers, correct positioning of pruning cuts should be emphasised, correct time of year for operations, reasons for pruning

Unit 205 Establish and Maintain Plants Outdoors

Outcome 4 Know how to maintain the health of plants outdoors

Assessment Criteria

The learner can:

1. Describe how to recognise **signs of damage or threats** to plant health and the appropriate method of control
2. State how seasonal weather conditions and soil condition affect **plant growth and health**
3. Describe methods used to **maintain/control plant growth**
4. Explain the relationship between **pruning and plant species** to include
   - timing of pruning
   - types of material for removal
   - method of pruning
   - positioning of cuts

Unit content

Signs of damage or threats

Signs of damage to leaves, roots, stems, flowers, yield/vigour, by physical means, pest and disease infestation, identify appropriate prevention and/or control methods.
Environmental threats: frost, drought, water logging, humidity, heat, light/shade, chemical spray drift
Nutritional deficiency/excess

Plant growth and health

Effects of seasonal weather conditions, effects of soil conditions, soil compaction and different soil types (e.g. clay), reasons for feeding, mulching, irrigation and support of established plantings, powered and non-powered maintenance equipment. Increase/decrease of pest and/or disease infestations, inappropriate soil pH levels for plants present

Maintain/control plant growth

To include: pruning, pinching/stopping, irrigation, feeding, pest and disease control, staking, tying, training, grafting, budding, providing frost protection and shade as necessary

Pruning and plant species

Reasons for pruning, timing of pruning, types of material for removal, including suckers, reverted shoots, dead heading, dead, damaged, weak or diseased, method of pruning, positioning of cuts, formative and routine pruning, regenerative pruning
Correct pruning techniques used to ensure required plant growth responses, shrubs- flowering on current season's growth, flowering on previous season's growth and those grown for winter stems and summer foliage

Unit 205 Establish and Maintain Plants Outdoors

Notes for guidance

This unit deals with the principles of planting and maintaining hardy plants, including trees, shrubs, and herbaceous plants in a range of situations. Preparation of the site is covered. The knowledge and understanding within this unit is applicable to plant establishment and maintenance in amenity and commercial situations and is essential to people working as practitioners in most horticultural workplaces.

In Outcome 1, learners are expected to be able to assess the soil texture, structure, pH and soil conditions to determine the preparation required for planting a range of hardy plants. They should be able to identify any specific hazards on site and carry out ground preparation for planting of woody and herbaceous plants and understand how the various cultivation operations affect the establishment of plants.

In Outcome 2, learners are expected to be able to plant bare-root and containerised trees and shrubs and herbaceous plants such as bedding plants or herbaceous perennials. This will include immediate aftercare, such as support, labelling, watering mulching and an understanding of the significance of planting depth and firming.

In Outcome 3, learners will carry out maintenance activities on a shrub or mixed border. They should understand the general needs of plants such as watering feeding, surface cultivation and mulching, but also the additional needs of specific plants, such as support or training. They should be able to identify the border plants and carry out pruning to promote the decorative characteristics of plants.

In Outcome 4, learners are expected to be able to assess a mixed border, identify specific pests, diseases, weeds and other threats to health, to assess the maintenance needs of the plants in the border and specify the different pruning needs of specific plants. They should understand how seasonal weather conditions and soil conditions affect plant growth, health and maintenance activities.

The unit may be delivered by a wide range of techniques, including lectures, supervised practical work, discussions, site visits and research. The delivery of this unit may be integrated with the delivery of other units where this is feasible. All methods should reinforce the importance of health and safety and environmental issues. Risk assessments must be undertaken prior to practical activities and learners should not be asked to undertake physical tasks beyond their physical capabilities.

Learners should have access to areas for preparation and planting, and established borders for practical lessons and assessment. Where resources at the centre are limited, visits to demonstration gardens/ historic gardens would be useful to complement lessons at the centre. All tasks should be undertaken at the correct time of the year and in appropriate weather conditions.

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Websites

www.rhs.org.uk Royal Horticultural Society

Unit 213 Participate in Providing Estate Maintenance

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of estate skills and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The aim of this unit is allow learners from a range of land-based disciplines to develop the skills and knowledge to maintain boundaries, surfaces or habitats.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to select, transport and use a range of hand tools and equipment for estate maintenance
2. Be able to maintain estate boundaries
3. Be able to maintain surfaces or habitats
4. Know how to work safely and minimise environmental damage

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU2.2 Maintain good standards of health and safety for self and others
CU20.1 Maintain structures and surfaces
CU20.2 Repair structures and surfaces
CU22.1 Construct, maintain and repair boundaries
CU23.1 Construct, maintain and repair paths

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SCC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 213 Participate in Providing Estate Maintenance

Outcome 1 Be able to select, transport and use a range of hand tools and equipment for estate maintenance

Assessment Criteria

The learner can:

1. Select appropriate **tools and equipment** for specific **estate maintenance tasks**
2. **Lift tools and equipment safely** using appropriate techniques
3. **Transport and use tools** and equipment **safely**
4. **Maintain and store** tools and equipment according to instructions

Unit content

Tools and equipment

Selection of appropriate tools and equipment (hammer, saw, spade, shovel, pickaxe, post driver, wire strainers, hoe, rake, fork, secateurs, shears, power tools)

Estate maintenance tasks

Constructing, maintaining and mending boundaries, structures and surfaces

Lift tools and equipment safely

Use of appropriate safe lifting techniques, in line with manual handling guidelines and Manual Handling Operations Regulations 1992, straight back, bend knees

Transport and use tools safely

Manual transport, mechanically assisted transport, security of tools

Maintain and store

Routine maintenance, (preparation, checking, adjusting, cleaning), storage, according to instructions

Unit 213 Participate in Providing Estate Maintenance

Outcome 2 Be able to maintain estate boundaries

Assessment Criteria

The learner can:

1. Assess the **condition of boundaries** to determine the maintenance requirement
2. Carry out **routine maintenance** of boundaries safely
3. Carry out **routine repairs** of boundaries safely
4. Dispose of **waste materials** in line with instructions

Range

Boundaries

Living boundaries: hedge, bank, ditch

Constructed boundaries: fence (post and rail, post and wire, electric, netting), wall (stone, brick)

Unit content

Condition of boundaries

Identified purpose, fitness for purpose, visual appearance, state of repair, health and safety implications (for people, livestock or vehicles and access)

Routine maintenance

Appropriate identified maintenance tasks, for example trimming hedges, clearing ditches, restoring banks, checking and adjusting wire tension, improving/maintaining access infrastructure (for example gaps, gates, stiles)

Routine repairs

Appropriate identified repair tasks (wood, brick or stone replacement or treatment)

Waste materials

By-products of repair or maintenance (hedge clippings, debris, litter, rotten wood)

Unit 213 Participate in Providing Estate Maintenance

Outcome 3 Be able to maintain surfaces or habitats

Assessment Criteria

The learner can:

1. Assess the condition of **surfaces** or **habitats** to determine the maintenance requirement
2. Carry out appropriate **maintenance or repairs** of surfaces or habitats

Unit content

Surfaces

Appropriate to the sector: solid (decking, concrete, paving), loose (gravel, wood chippings, sand), horse riding arena surfaces

Habitats

Appropriate to the sector: pond, woodland, heath, field margins, grassland, grazing land

Maintenance or repairs

Identified tasks: adding surface, applying a surface treatment, levelling surface, clearing or restoring a habitat, improving/maintaining access infrastructure (for example boardwalks, stone pitching, grass sward management)

Unit 213 Participate in Providing Estate Maintenance

Outcome 4 Know how to work safely and minimise environmental damage

Assessment Criteria

The learner can:

1. State the current environmental and health and safety **legislation and codes of practice**
2. Describe how to overcome **problems** presented by **services**
3. Describe how **environmental damage** can be minimised
4. Describe how **organic and inorganic waste** may be **disposed** of

Unit content

Legislation and codes of practice

Health and Safety at Work etc Act 1974, Control of Substances Hazardous to Health Regulations (2002) (COSHH), Waste Management (England and Wales) Regulations 2006 (as amended 2008)

Problems

Damage, leakage, disruption to supply, health and safety/emergency procedures, reporting to supervisor

Services

Water, electricity, gas, telephone

Environmental damage

Pollution (water courses, through litter or debris, noise), damage to habitats**,** wastage of resources

Disposal of organic and inorganic waste: organic waste (recycling, composting, chipping, burning), inorganic waste (recycling, discarding safely, landfill)

Organic and inorganic waste

Organic: wood and plant products, soil, weeds, green waste, animal dung and waste

Inorganic: metal, plastics, concrete, brickwork, oils and lubricants

Disposed

Organic: composting, recycling, chipping, burning, burial

Inorganic: recycling, landfill, approved disposal contractor

Unit 213 Participate in Providing Estate Maintenance

Notes for guidance

This unit has a very practical focus and aims to enable learners to develop estate skills which can be applied to a range of situations and circumstances. The unit has been written such that naturally occurring and locally relevant opportunities can be used in selecting boundaries, structures and surfaces, to repair and maintain.

As learners will be engaged in practical activity there should be an emphasis on safe working practices, including the use of appropriate Personal Protective Equipment (PPE) and appropriate risk assessments should be undertaken. Learners should also be made aware of the impact on the environment, and sustainability concepts should also be demonstrated where possible. Where learners are using tools, they should be supervised and must be made aware of the safety of themselves and others around them.

Learners should have the opportunity to undertake estate skill activity in a setting appropriate to their area of work wherever possible to maximise the vocational relevance. It will be most beneficial if the structures, boundaries, and surface or habitat selected are for a clear purpose.

Outcome 1 is likely to be predominantly practical, as learners are required to select and safely transport and use a range of hand tools. It is not expected that learners demonstrate a practical ability for the full range shown in the unit content, but a minimum of four hand tools should be covered.

Outcomes 2 and 3 require opportunities for supervised practical experience. This may link with an appropriate work placement. It is anticipated that the tutor will guide selection of the repair or maintenance work required. It is particularly important that due regard is given to health and safety, including the use of appropriate PPE.

Outcome 4 will be largely embedded throughout delivery of the practical aspects of this unit. Learners should view working safely, with due regard to the environment as an integral feature of estate skills tasks, rather than as stand alone components.

It is anticipated that most delivery of this unit will take place in a practical setting, with supervised practice of skills. Delivery will also include some classroom based activity in ensuring learners have a good understanding of safe techniques and underpinning knowledge.

References

Books

Agate, E. 2001. *Fencing: A Practical Handbook*. Doncaster: BTCV. ISBN 094675229X.

Agate, E. 1996. *Footpaths: A Practical Handbook*. Doncaster: BTCV. ISBN 0946752311.

Agate, E. 2000. *Toolcare: A Maintenance and Workshop Manual*. Doncaster: BTCV. ISBN 0946752249.

Agate, E. 2001. *Tree Planting and Aftercare: A Practical Handbook*. Doncaster: BTCV. ISBN 0946752257.

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Agate, E., Brooks, A. 2001. *Waterways and Wetlands: A Practical Handbook*. Doncaster: BTCV. ISBN 0946752303.

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MacLean, M. 1992. *New Hedges for the Countryside*. Ipswich: Farming Press Books and Videos. ISBN 0852362420.

Journals

Scottish Executive Rural Affairs Department — Prevention of Environmental Pollution from Agricultural Activity: Code of Good Practice Dos and Don'ts Guide
(Scottish Executive, 2002) ISBN 0755905180

Websites

www.btcv.org.uk	British Trust for Conservation Volunteers
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of agriculture and Rural Affairs (Northern Ireland)
www.fwag.org.uk	Farm Wildlife and Advisory Group
www.hse.gov.uk	Health and Safety Executive
www.lantra.co.uk	Lantra Sector Skills Council

Unit 214 Environmental and Land-based Business

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of business within the environmental and land-based sector, and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or to further education and training.

The learner will investigate the structure of one industry within the land-based sector and the principal organisations within it. They will explore regulations and legislation relevant to that industry. The learner will develop the knowledge of common business operations and the simple administrative tasks.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know an industry within the environmental and land-based sector
2. Know the relevant legislation and codes of practice within the environmental and land-based sector
3. Know common business operations
4. Know how to carry out simple administrative tasks

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

n/a

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 214 Environmental and Land-based Business

Outcome 1 Know an industry within the environmental and land-based sector

Assessment Criteria

The learner can:

1. Describe the **structure** of one industry within the environmental and land-based sector covering:
    - size
    - employment
    - main activities
    - geographical influence
    - economic contribution
2. Identify the **principal organisations and trade associations** within an industry in the environmental and land-based sector.

Unit content

Structure

Features and characteristics of the industry, different types of businesses and organisations and the type of goods and services they provide, size of these businesses/organisations e.g. numbers employed, regional differences, allied industries (what they are, the goods and services they supply and the role they play), trends and issues currently affecting the industry

Principal organisations and trade associations

Roles and aims of key selected organisations in the industry e.g. statutory, Department for Environment, Food and Rural Affairs ((Defra) England), Welsh Assembly Government (Wales), Scottish Executive Environment and Rural Affairs Department (SEERAD), or Department of Agriculture and Rural Affairs (DARD (Northern Ireland), Health and Safety Executive, Department of Trade and Industry (DTI), Environment Agency, Food Standards Agency, non-governmental, major land-owning or representative e.g. The Royal Society for the Prevention of Cruelty to Animals (RSPCA), British Veterinary Association (BVA), Royal Horticultural Society (RHS), Institute of Groundsmanship (IOG), Lantra Sector Skills Council, British Horse Society (BHS), National Farmers Union (NFU), National Trust, Natural England

Unit 214 Environmental and Land-based Business

Outcome 2 Know the relevant legislation and codes of practice within the environmental and land-based sector

Assessment Criteria

The learner can:

1. Identify the main United Kingdom or European **legislation and codes of practice** relating to one industry within the environmental and land-based sector
2. Identify key requirements of current **employment law** on the environmental and land-based sector

Unit content

Legislation and codes of practice

United Kingdom legislation: consideration of the main relevant current legislation relating to an industry in the land and environment sector for example Agriculture Tenancies Act (1995), Animal Health Act (2002), Welfare of Animal (Transport) Order 2006, Animal Welfare Act 2006, Environment Protection Act 1990 (as amended 1995), Control of Pesticides Regulations 1986 (COPR), Riding Establishments Act 1970, Horse Passports (England) Regulations 2004, Control of Dogs Order 1992, Dangerous Dogs Act 1991(as amended 1997), codes of practice e.g. welfare of farm or companion animals

European legislation: relevant European directives e.g. relating to employment, the environment and the specific industry in the land and environment sector

Employment law

The main relevant current legislation relating to employment e.g. Health and Safety at Work etc Act 1974, Control of Substances Hazardous to Health Regulations (2002) (COSHH), Working Time Regulations 1998 (as amended 2002), Disability Discrimination Acts 1995 (as amended 2005), Employment Act 2002, National Minimum Wage Act 1998, Race Relations Act 1976 (as amended 2003), Sex Discrimination Act 1975

Unit 214 Environmental and Land-based Business

Outcome 3 Know common business operations

Assessment Criteria

The learner can:

1. Describe how **common IT software** can be used in everyday business operations
2. State the purpose and operation of **common business tasks**
    - financial and banking
    - marketing
    - administrative tasks

Unit content

Common IT software

Examples of business uses of: word processor (e.g. letters, notices), spreadsheets (e.g. records, timesheets), database (e.g. records), graphics (e.g. advertisements, posters), e-mails

Common business tasks

Financial and banking: taking payments by cash, cheque, debit card and credit card, ordering procedure for supplies, invoices, types of bank account (current, savings), loans, overdraft, methods of payment (debit card, cheques, bank giro credit, standing order, direct debit)
Marketing: ways to promote a business (advertisements, promotional events, referral / word of mouth, importance of customer care), preparation of promotional materials
Administrative tasks: file documents, complete simple records (e.g. production, customers), check stock levels and complete stock control records, communicate using written and electronic media, importance of security and confidentiality of business records

Unit 214 Environmental and Land-based Business

Outcome 4 Know how to carry out simple administrative tasks

Assessment Criteria

The learner can:

1. Use appropriate methods to **prepare, present, sort and retrieve information**
2. Carry out simple **accounting and administrative tasks** appropriate to the business

Unit content

Prepare, present, sort and retrieve information

Use of IT and paper filing systems, completion of simple business records, preparation of business documents (e.g. letters, advertisements)

Accounting and administrative tasks

Completion of orders, invoices, cheques, conduct stock check and complete stock records

Unit 214 Environmental and Land-based Business

Notes for guidance

This unit can be applied to any of the industries in the environmental and land-based sector, and delivery should be specifically tailored to the vocational interests of learners and the qualification being studied. They will learn about the industry and legal context in which businesses in the chosen sector takes place, and important operations necessary to manage a business.

In Outcome 1, learners will study the structure of their industry. They may be encouraged to represent graphically the range of businesses and their products/services, and also the ancillary businesses on which the primary businesses depend. They could relate these ideas to a specific business, whilst also investigating the range of businesses found locally and nationally. Learners will also find out about the principal organisations and trade associations concerned with their industry, and will investigate the roles and impact of selected organisations. They will investigate some of the key trends and issues facing their industry and how it is responding. Delivery of this outcome would be enriched by speakers from selected organisations.

Outcome 2 examines the UK and European legal framework affecting businesses in the particular land-based industry. Learners are not expected to become legal experts, but to develop an awareness of the main pieces of legislation and how they impact on business in their industry. Delivery of this outcome could be enhanced by guest speakers with experience of running a business or becoming self employed for the first time.

In Outcome 3, learners will identify how common IT software can be used to perform a range of everyday business operations. Some of these are common to all businesses (e.g. writing letters), but tutors should ensure that examples are vocationally relevant to the subject area of the learners. It would be helpful for learners to have the opportunity to practice some of the IT skills to carry out simulated business tasks. Learners should find out about day-to-day business activities involving finance and banking, but will not be expected to learn about accounts. It would help learners to have the opportunity to study a range of records (financial and non-financial) that are kept in a specific business, and how these are maintained and used.

Outcome 4 links closely with Outcome 3 and gives learners the opportunity to understand and engage in operations and tasks identified previously. This should include preparing a range of business outputs using the IT applications listed. These could relate to other items in the content, e.g. advertisements, posters, specific records appropriate to businesses in their industry. They will also complete examples of paper based records and ensure that both IT and paper records are filed appropriately.

References

Books

Carysforth, C. Neild, M. 2006. *BTEC First Business*. 2nd ed. Oxford: Butterworth Heinemann.

Canwell, D., Sutherland, J. 2006. *BTEC First Business*. Cheltenham: Nelson Thornes.

Websites

www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.bized.ac.uk	Business Education Websites

www.hse.gov.uk	*Health and Safety Executive*
www.dti.gov.uk	*Department for Trade and Industry*
www.environment-agency.gov.uk	*Environment Agency*
www.food.gov.uk	*Food Standards Agency*
www.rspca.org.uk	*Royal Society for the Prevention of Cruelty to Animals*
www.bva.co.uk	*British Veterinary Association*
www.rhs.org.uk	*Royal Horticultural Society*
www.iog.org.uk	*Institute of Groundsmanship*
www.lantra.co.uk	*Lantra Sector Skills Council*
www.bhs.org.uk	*British Horse Society*
www.nfuonline.com	*National Farmers Union*
www.nationaltrust.org.uk	*The National Trust*
www.naturalengland.org.uk	*Natural England*

Unit 219 Identification and Control of Plant Problems in the Land-based Sector

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of identification and control of plant problems in the land-based sector, and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or to further education and training.

The learner will be aware of the range of pests, diseases, disorders and weeds in a given land-based situation. They will develop skill in the recognition and diagnosis of plant problems and knowledge of the habit, life cycles of pests and the environmental factors that favour their development. A range of options for the control of plant problems is also covered, along with the legislative and environmental implications relating to control measures.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know common plant pests, diseases and disorders in a land-based situation
2. Understand how to deal with plant pests and diseases
3. Assess the requirement for weed control in a crop, planted area or turf
4. Be able to deal with pests, diseases and disorders

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU78 Identify the presence of pests, diseases and disorders and assist with their control

PH3.3 Maintain plant development

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 219 Identification and Control of Plant Problems in the Land-based Sector

Outcome 1 Know common plant pests, diseases and disorders in a land-based situation

Assessment Criteria

The learner can:

1. Identify the signs of and damage caused by common **plant pests and diseases**
2. Explain the **classification of plant pests and diseases**
3. Describe the **life cycles** of typical groups of plant pests and diseases
4. Recognise **environmental and nutritional disorders in plants** and cultural solutions to the problems.

Unit content

Plant pests and diseases

Differentiate between pests, diseases, disorders
Pests: rodents and other mammals, birds, molluscs, insects which affect aerial plant parts (foliage, stems, flowers as applicable), insects affecting sub-surface tissues (roots, bulbs, tubers), mites, nematodes
Diseases: fungal diseases affecting aerial plant parts, fungal diseases affecting sub-surface tissues, fungal diseases affecting stored plant material, viral diseases, bacterial diseases
Identify six common pests and four common diseases

Classification of plant pests and diseases

Pests: rodents and other mammals, birds, slugs and snails (Mollusca), Arthropods – insects: aphids and relatives (Hemiptera), thrips (Thysanoptera), moths and butterflies (Lepidoptera), flies (Diptera), beetles and weevils (Coleoptera), sawflies, ants (Hymenoptera), mites (Acarina), nematodes (Nematoda)
Diseases: fungal (zygomycetes, ascomycetes, basidiomycetes, deuteromycetes), viral diseases, bacterial diseases

Life cycles

Examples of life cycle for one rodent or other mammal or bird pest; one mollusc; one insect with a complete metamorphosis; one insect with an incomplete metamorphosis; one mite; one nematode; one complex fungal life cycle involving different spore types or alternate hosts (e.g. rust or powdery mildew), one simple fungal life cycle (e.g. Pythium, Botrytis cinerea); one bacterial disease; a simple explanation of the functioning and spread of plant viruses

Environmental and nutritional disorders in plants

Environmental disorders: extremes of temperature; under and over-watering; hail and snow damage; wind and sun scorch; lack of light
Nutritional disorders: low or high pH problems; nutrient deficiencies (Nitrogen, Phosphorous, Potassium, calcium, Magnesium, Iron) and excess Nitrogen, root scorch

Unit 219 Identification and Control of Plant Problems in the Land-based Sector

Outcome 2 Understand how to deal with plant pests and diseases

Assessment Criteria

The learner can:

1. Select appropriate **cultural, chemical or biological control measures** for named pests and diseases
2. Describe how an **environmental assessment** is carried out
3. Select appropriate **equipment** for the application of chemicals for specific purposes
4. List the main requirements of **COSHH i**n relation to chemical use.

Unit content

Cultural, chemical or biological control measures

Cultural: control of alternate hosts, disturbance, habitat destruction, barriers / exclusion, optimal growing regimes, crop rotation, hygiene, resistant varieties, amend temperatures and humidity
Chemical: modes of action (contact and systemic), insecticides, acaricides, molluscicides, fatty acids and related formulations, also fungicides
Biological: natural pest control native and exotic parasites, (e.g. *Encarsia formosa*) predators (eg *Phytoseiulus persimilis*), bacterium (e.g. *Bacillus thuringiensis*) and fungal (*Verticillium lecanii*) agents, surfactants
Integrated Pest Management (principles of), utilisation of two or more control methods
Awareness of the requirements of the Food and Environmental Protection Act 1985 (FEPA)

Environmental assessment

Carry out an environmental assessment of a given site to include: species present, pH, soil type, drainage, damage present, potential for environmental damage during works, rainfall, site access, sunlight, site orientation

Equipment

For spray, drench, controlled droplet, fumigation, dust, granule and fog application
Relevant Personal Protective Equipment (PPE)
Biological: natural pest control, cards, packets, bottles, vials

Control of Substances Hazardous to Health 2002 (COSHH) assessment

Identify hazardous substances that may be present or produced, identify if there is potential for exposure, obtain relevant data, identify tasks which may lead to exposure, assess risk, record findings, identify and apply control measures, review and update as necessary

Unit 219 Identification and Control of Plant Problems in the Land-based Sector

Outcome 3 Assess the requirement for weed control in a crop, planted area or turf

Assessment Criteria

The learner can:

1. Identify the type and species of **weeds** in a given area and select appropriate control measures
2. Carry out **cultural control** of weeds
3. Describe damage caused by **ephemeral, annual, perennial weeds** and their means of spread
4. Describe **environmental requirements** for weed emergence and growth.

Unit content

Weeds

Examples of ephemeral, annual and perennial weeds, examples of weeds that spread by seed, fragmentation, stolons, rhizomes, root sections
Examples of weeds that indicate particular soil or other conditions
Control measures: cultural/mechanical, herbicides (total, contact, translocated, residual), flame weeding, mulching, use of weed suppressant geotextiles, stale seed beds
Identify ten weeds by their common names (botanical names would be beneficial), to include examples of ephemeral, annual and perennial weeds

Cultural controls

Hoeing, hand weeding, digging out (trowel,spade/fork), use of 3 pronged cultivator, shallow mechanical cultivation, mulching, scarifying

Ephemeral, annual, perennial weeds

Weeds provide competition for; light, moisture, nutrients, space
Weeds may be unsightly
Weeds can act as hosts for pests and diseases e.g. aphid and rust
Means of spread include; seed, stolons, rhizomes, bulbs, fragmentation

Environmental requirements

Temperature, dormancy to be broken allowing germination, light, moisture, suitable growing medium/surface

Unit 219 Identification and Control of Plant Problems in the Land-based Sector

Outcome 4 Be able to deal with pests, diseases and disorders

Assessment Criteria

The learner can:

1. Carry out **cultural or physical control** of pests and diseases
2. Demonstrate the **calibration and use of a knapsack sprayer**
3. Carry out **cultural operations to deal with disorders**
4. Carry out a simple **environmental assessment.**

Unit content

Cultural or physical control

Pruning, stopping/pinching out soft tops, spacing, mulching, hand removal, humidity and temperature control, general hygiene

Calibration and use of a knapsack sprayer

Calibrate a knapsack sprayer using a simulated chemical, calculate chemical and carrier (water) quantity, mix and avoid 'simulated chemical' spillage and wastage after usage, selection and attachment of correct spray nozzle, rinse out sprayer and dispose of residue in a safe and appropriate manner

Cultural operations to deal with disorders

For example avoid: incorrect pH level in soil/growing media, frost damage, drought, scorch, moisture/humidity and temperature fluctuations, nutritional deficiency and excess, ensure appropriate application of water e.g. overhead application could result in cold water damage on foliage

Environmental assessment

Environmental assessment of a selected site to include: light, moisture/humidity, temperature, presence of weeds and weed seeds, plant species, size and number. Undertake soil textural analysis and pH determination of the soil, determine presence of pests, diseases inclusive of symptoms and damage (and disorders)

Unit 219 Identification and Control of Plant Problems in the Land-based Sector

Notes for guidance

This unit is applicable to learners working in production and amenity horticulture and the turf sectors of the industry and as such should be delivered in both general principles and as applicable to the specific context.

In Outcome 1 this should be interpreted as a clear understanding of a range of general signs and symptoms of pests, diseases and disorders, together with a more detailed identification of specific problems. So, for example, all learners should be familiar with the general symptoms of damage caused by sap-sucking insects. Those following production horticulture may study the damage caused by glasshouse whitefly in greater detail.

Similarly, the general details of an incomplete metamorphosis should be covered in all cases. Production horticulture learners may study in more detail glasshouse whitefly, where the number of instar stages would be covered.

It should be noted that the classification of pests and diseases should be dealt with in outline only as this is a level 2 qualification. Correct biological names of the classes of e.g. insects have been entered in the outcome as a means of clarification for tutors and do not need to be covered as part of formal study.

Outcome 2 should be approached in a similar way. Learners studying turf should be aware of the wide range of control measures available within horticulture, but make more detailed study of cultural and chemical controls for turf pests and diseases. Learners should carry out an environmental assessment of a given site to incorporate potential for damage to occur during works.

This approach also applies to Outcome 3. All learners should be aware of the range of weeds and their control. Those following an amenity horticulture pathway should focus upon relevant weeds for mixed borders and relevant controls (mulching, hoeing, residual herbicides etc) for that context. Learners must identify ten weeds by their common names (botanical names would be beneficial), to include examples of ephemeral, annual and perennial weeds.

Outcome 4 gives the learner the opportunity to use cultural/ physical methods of control and to practise techniques for the application of chemicals with simulated chemical and clean equipment. They should not use real chemicals for this outcome. Learners should be taught and follow the procedures that they would for real pesticides. Learners who hold relevant qualifications recognised under legislation for applying pesticides (Certificates of Competent) may use these against the relevant parts of this outcome.

Within this unit the learner will need to demonstrate their knowledge of a range of pests, diseases, disorders and weeds in a given land-based situation. As part of this developmental process learners must be formally required to identify six common pests and four common diseases and ten weeds by their common names. The unit content could be covered by learners as group 'adopting' a given site(s) and to be actively engaged its maintenance and development, thus providing a feeling of ownership. Where this is not feasible off site visits to local gardens, arboreta, estates, glasshouse units and enterprises may be an option to bring the unit alive and to provide learner focus to the topic being covered.

Learners to be aware that all tasks should be undertaken at the correct time of year and in appropriate weather conditions. It must also be emphasised to learners that all tasks must be undertaken in a safe manner with all appropriate PPE being worn. Learners must demonstrate knowledge of the requirements of COSHH and FEPA.

References

Books

Each particular context may have specific texts and good use should be made of current product lists and guidance for chemical and biological control.
For general background to the unit:

Adams CR. 2008. *Principles of Horticulture*. 5th ed. Oxford: Butterworth Heinemann. ISBN: 978-0-7506-8694-5.

Unit 220 Introduction to Land-Based Machinery Operations

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of land-based machinery operations and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop the skills and knowledge to select, prepare, operate, and maintain a range of land- based equipment and machines appropriate to their area of study. The learner will also cover the health and safety requirements associated with the use and maintenance of machines.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Understand safe working principles when using equipment and machinery
2. Be able to prepare land-based equipment and machinery for use
3. Be able to operate land-based equipment and machinery
4. Be able to maintain land-based equipment and machinery

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU27 Maintain equipment and machines

L27 Use and maintain non-powered and hand held powered tools and equipment.

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 220 Introduction to Land-based Machinery Operations

Outcome 1 Understand safe working principles when using equipment and machinery

Assessment Criteria

The learner can:

1. Select **appropriate equipment** for land-based tasks
2. Explain why **manufacturers' instructions** should be followed when working with land-based equipment and machines
3. Explain the **legal and environmental requirements** associated with specific machines
4. Identify the **controls/devices/instruments** and other health and safety requirements for machinery and equipment

Range

Agriculture

As appropriate from:
Types: powered and powered machines, tractor mounted, trailed or self propelled, seeding/ planting equipment
Purposes: seedbed preparation, crop harvesting, materials application, liquids, solids, granules, powders

Horticulture/Landscape

As appropriate from:
Types: non powered tools and equipment, hand held power tools, pedestrian controlled machines, ride on machines
Purposes: ground preparation, grass cutting and collection, materials application, liquids, granules, powders, pelleting, chipping, shredding

Unit content

Appropriate equipment

As outlined above, selection, fit for purpose, ground conditions, suitability for scale of work, training/certification requirements

Manufacturers' instruction

Dealer installation process, operator instruction manuals, manufacturer web sites

Legal and environmental requirements

Health and Safety at Work etc Act 1974 (HASWA), Provision and Use of Work Equipment Regulations 1998 (PUWER), Lifting Operations and Lifting Equipment Regulations 1998 (LOLER Control of Substances Hazardous to Health Regulations (2002) (COSHH),
Control of Pesticides Regulations 1986 (COPR), Environmental contamination, Personal Protective equipment (PPE)

Controls/devices/instruments

Operator controls, power unit controls, manual, hydraulic, electronic, machine adjustment/performance settings - safe start devices, clutches, performance/load limiters, seat occupation switches, guards – warning lights, analogue/digital information

Unit 220 Introduction to Land-Based Machinery Operations

Outcome 2 Be able to prepare land-based equipment and machinery for use

Assessment Criteria

The learner can:

1. Carry out **adjustments** on land-based equipment and machines to meet specific requirements prior to use
2. Explain the **benefits** of correct adjustment of equipment and machines
3. Carry out **pre-start checks,** including **fuelling**

Range

Agriculture

As appropriate from:
Types: powered and powered machines, tractor mounted, trailed or self propelled, seeding/ planting equipment
Purposes: seedbed preparation, crop harvesting, materials application, liquids, solids, granules, powders

Horticulture/Landscape

As appropriate from:
Types: non powered tools and equipment, hand held power tools, pedestrian controlled machines, ride on machines
Purposes: ground preparation, grass cutting and collection, materials application, liquids, granules, powders, pelleting, chipping, shredding

Unit content

Adjustments

Operator fit, working height/depth/speed/calibration/tilth/work rate

Benefits

Specific work rates/outputs achieved, power/fuel consumption, risk of premature wear/damage to equipment, operator fatigue

Pre-start checks

Lubricants, cooling, fuel level, wheel equipment, safety guards, road legal, machine/vehicle security, PPE

Fuelling

Fuel types, fuel contamination checks, correct storage, machine power isolation, ventilation, spillage, safe areas, fire hazards, PPE

Unit 220 Introduction to Land-Based Machinery Operations

Outcome 3 Be able to operate land-based equipment and machinery

Assessment Criteria

The learner can:

1. **Operate** equipment and machines safely and **efficiently** for different land-based activities
2. Carry out activities to achieve the **desired results** when operating land-based equipment and machines

Range

Agriculture

As appropriate from:
Types: powered and powered machines, tractor mounted, trailed or self propelled, seeding/ planting equipment
Purposes: seedbed preparation, crop harvesting, materials application, liquids, solids, granules, powders

Horticulture/Landscape

As appropriate from:
Types: non powered tools and equipment, hand held power tools, pedestrian controlled machines, ride on machines
Purposes: ground preparation, grass cutting and collection, materials application, liquids, granules, powders, pelleting, chipping, shredding

Unit content

Operate

Attachment to power unit, engagement of power, assess test runs and re-adjust, site assessment for hazards/risks, continuous monitoring of performance, over/under lapping

Efficiency

Acceptable work rates, back up power availability, economy of fuel, wearing component lifespan

Desired results

All area covered, correct application rates/tilth of seedbed, quality of cut, avoid undesirable results (compaction of soil, wheel marks in seedbed)

Unit 220 Introduction to Land-Based Machinery Operations

Outcome 4 Be able to maintain land-based equipment and machinery

Assessment Criteria

The learner can:

1. Identify **routine maintenance** for land-based equipment and machines using manufacturers' instructions
2. Identify **hazards** and comply with risk assessments **during maintenance activities**
3. Carry out different **routine maintenance activities** safely on a range of equipment and machines
4. **Record maintenance activities** in an **appropriate format**

Range

Agriculture

As appropriate from:
Types: powered and powered machines, tractor mounted, trailed or self propelled, seeding/ planting equipment
Purposes: seedbed preparation, crop harvesting, materials application, liquids, solids, granules, powders

Horticulture/Landscape

As appropriate from:
Types: non powered tools and equipment, hand held power tools, pedestrian controlled machines, ride on machines
Purposes: ground preparation, grass cutting and collection, materials application, liquids, granules, powders, pelleting, chipping, shredding

Unit content

Routine maintenance

Pre-work assessment of machine condition, routine/periodic maintenance, adjustments for wear, lubrication, replacement components, preparation for storage, cleaning, lubrication and protection

Hazards during maintenance activities

Identify hazards according to operations

Record maintenance activities

Complete maintenance record sheet/job cards, record service/maintenance interval/date/work done, record replacement of wearing components, working life

Appropriate format

Manufacturers documentation, service record book, service record charts, company procedures, electronic record storage, service interval label on machine

Unit 220 Introduction to Land-based Machinery Operations

Notes for guidance

This unit is designed for learners who will be given responsibility for field/groundwork using machines typical to their area of study. The unit will provide learners with knowledge and understanding, operational skills and service procedures to prepare, use, maintain and store machines and equipment. Throughout the unit the emphasis will be on acceptable health and safety procedures and safe working practices. It is expected that where tractor mounted machines are to be utilised, prior learning on tractor operations will have been assessed to ensure the learner has reached an acceptable level of skills and knowledge.

The range covered during delivery should include electric vehicles and machinery.

Health and safety - Centres and tutors aware of the need to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of machinery is involved. This unit requires the learner to undertake machinery operations under close supervision, and this is the same for any unit within the qualification that requires the learner to operate or use machinery. This is a largely practical-based unit which looks at the basic preparation, operation and maintenance of equipment and machinery. There is significant emphasis on safe practices throughout the unit and reference to risk assessment in learning outcome 4. Throughout the unit the emphasis is on acceptable health and safety procedures and safe working practices. The guidance in this unit requires that Health and Safety must be strictly enforced and repeated throughout. The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

In Outcome 1 the learner will be able to select a suitable item of equipment to perform a range of land-based tasks to achieve given outcomes. The learner will be able to understand basic working principles of the equipment and any environmental and legal issues relating to the machines' use.
Manufacturers' instructions are to be followed at all times to interpret operator controls and instrumentation information.

In Outcome 2 the learner is expected to demonstrate skills in the use of machines and equipment used in the area of their study. This may entail operator set up, connection to power source and initial setting prior to moving on site. Where tractor trailed, mounted or self propelled equipment is to be used an understanding of safe fuelling and transportation must be demonstrated. With ever-increasing costs on fuel, wearing components and operator time, an understanding of the benefits of correct operating procedures, setting linked to work rate targets must be understood.

In Outcome 3 the learner needs to be aware of a range of machine capabilities to achieve specified performance criteria. These may be work rate targets, quality of work, height/depth of work or delivery rates. Field/site procedures need to be correctly chosen where subsequent operations are to follow. Seeding requires a specific depth of seedbed, a fineness of tilth to suit seed type, minimum seedbed compaction with no wheel marks evident.

In Outcome 4 the learner must be able to identify from the manufacturers' instructions, and demonstrate maintenance requirements and procedures. Where power sources are used, maintenance of those sources will need to be identified. Risks of injury/damage to self, others, the environment or equipment need to be identified by the learner and control measures put in place prior to commencement of any maintenance tasks. To enable evaluations and costings to be done an accurate record of work, maintenance and replacement parts must be recorded. This may also be of benefit where warranty procedures are to be implemented to recoup costs of breakdowns.

References

Books

Bell B. 2005. *Farm Machinery.* Old Pond Publishing. ISBN: 1-903-36668-2.
Culpin C. 1992. *Farm Machinery, 12th edition.* Blackwell Scientific. ISBN: 0-632-03159-X.

Journals

Horticultural Weekly
Profi International
Manufacturers publications and manuals
Lubrication charts and data sheets

Websites

www.bagma.com	British Agricultural and Garden Machinery Association
www.defra.gov.uk	Dept for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.hse.gov.uk	Health and Safety Executive

Unit 221 Introduction to the Principles of Land-based Machinery

Level: 2

Credit value: 5

Unit aim

This unit aims to provide learners with an understanding of the principles of land-based machinery and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to recognise the basic roles and functions of engines as the major power source for Land-based machines. It covers knowledge and skills including the working principles of engines and typical engine maintenance activities that may be carried out by the operator.

Learning outcomes

There are **three** learning outcomes to this unit. The learner will:

1. Know the working principles of combustion engines
2. Know the maintenance requirements of machines
3. Be able to maintain engines on land-based machines

Guided learning hours

It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU27 Maintain equipment and machines
L27.1 Use and maintenance of non-powered and hand held power tools and equipment
L27.2 Carry out routine maintenance to equipment and machinery

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SCC.

Assessment and grading

This unit will be assessed by:

- An assignment covering assessed practical competencies and underpinning knowledge

Unit 221 Introduction to the Principles of Land-based Machinery

Outcome 1 Know the working principles of combustion engines

Assessment Criteria

The learner can:

1. Describe the uses of **combustion engines** on a range of machines within a land-based industry
2. Describe the **working cycles of 2 stroke and 4 stroke engines**
3. State the **functions of component parts** of a combustion engine
4. Describe methods of **transmitting drive** from engines to the working parts of machines

Unit content

Combustion engines

Compression Ignition (CI), Spark Ignition (SI)

Working cycles of 2 stroke and 4 stroke engines

Otto cycle, 2 stroke cycle, air induction, exhaust emissions

Function of component parts

Crankshaft, pistons, connecting rods and bearings, piston rings, bore types, camshaft, valves and springs, oil pump, flywheel

Transmitting drive

Friction plate clutches centrifugal clutches, hydraulic clutches, belt and pulleys, chain and sprocket, gears, electrical generator, compressed air, hydraulics

Unit 221 Introduction to the Principles of Land-based Machinery

Outcome 2 Know the maintenance requirements of machines

Assessment Criteria

The learner can:

1. Describe **common hazards** associated with machine use and maintenance
2. State the purpose of common **workshop tools**

Range

All Learners: activities in maintenance workshop and on site, periodic maintenance, preventative maintenance, unscheduled maintenance

Unit content

Common hazards

Machine power isolation, machine stability and contamination from fuels/lubricants/chemicals/sharps/heat/pressure/fumes

Workshop tools

Spanners/sockets and wrenches, torque wrenches and multipliers, screwdrivers, hammers, punches, service gauges and measuring equipment, tool kit and on site tool kit

Unit 221 Introduction to the Principles of Land-based Machinery

Outcome 3 Be able to maintain engines on land-based machines

Assessment Criteria

The learner can:

1. Carry out a **risk assessment** for machine **maintenance activities**
2. Carry out **pre-start checks and starting procedures** on machines

Unit content

Risk assessment

Risks to self, risks to others, risk to environment, risk to machines and equipment

Pre-start checks and starting procedures

Fuel level, oil levels, coolant and cooling, safety guards and panels, fume extraction within buildings, safe operation distances, safety start devices, engine/turbocharger oil pressure

Maintenance activities

Machine preparation prior to routine/scheduled maintenance, unscheduled maintenance on site, safe use of tools, selection of correct replacement service components, preparation of service area, re-instatement of service area, post service inspection of machine

Also, need to cover:

Current Legislation

Health and Safety at Work etc Act1974 (HASWA), Provision and Use of Work Equipment Regulations 1998 (PUWER), Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)

Maintenance records

Maintenance check lists, job cards, inspection reports, recording machine details and work hours, records of repairs/replacement parts

Unit 221 Introduction to the Principles of Land-based Machinery

Notes for guidance

This unit is designed to provide learners with knowledge and understanding of basic working principles of Land-based powered equipment, requirements for regular service, maintenance and repair and safe practical experiences while undertaking maintenance tasks.

The range covered during delivery should include electric vehicles and machinery.

Health and safety - Centres and tutors need to be aware of the need to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of machinery is involved. This unit requires the learner to undertake machinery operations under close supervision, and this is the same for any unit within the qualification that requires the learner to operate or use machinery. This is a largely theory based unit, but Outcome 3 requires learners to be able to maintain engines on land-based machines. Throughout the unit the emphasis is on acceptable health and safety procedures and safe working practices. The guidance in this unit requires that Health and Safety must be strictly enforced and repeated throughout. The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

In Outcome 1 the learner will be required to investigate working principles of the range of engine types that power land-based vehicles and machines. It is essential that the learner understands the limitations of engine types and why manufacturers designate their use to different purpose. The learners should be encouraged to develop understanding of topical issues regarding available fuel types, environmental pollution and running costs.

Outcome 2 prepares the learner for the knowledge and understanding required prior to undertaking practical maintenance work on engines and powered machines. Emphasis should be directed to safe working practices, care of machines, tools and work areas. The learner should also be encouraged to plan for unscheduled maintenance tasks. Due to the complexity of land-based vehicles and machines it is essential that learners understand that maintenance of machines and vehicles must be carried out to manufacturers recommendations and that service documentation should be available and accurately followed when performing tasks.

In Outcome 3 the learner will be required to carry out risk assessments and put appropriate control measures in place before completing the practical activities. It is anticipated that delivery of this outcome will be predominantly practical, with learners gaining experience of carrying out pre-start checks. The learner must be aware of current legislation and safe working practices and be encouraged to adopt a clean, tidy and methodical approach to work ethic. The importance of accurate completion of maintenance and work records must be highlighted.

Throughout the unit the emphasis will be on safe, legal practices, working to manufacturers' recommended procedures and attention to detail when recording information.

References

Books

Bell B. 2005. *Farm Machiner. 5th e.* Old Bond Publishing. ISBN: 1-903-36668-2.
Hillier V and Coombes P. 2004. *Hillier's Fundamentals of Motor Vehicle Technolog. 5th ed.* Nelson Thornes. ISBN: 0-748-78082-3.

Manufacturer's service charts, operator manuals

Websites

www.howstuffworks.com Discovery Communications
www.hse.gov.uk Health and Safety Executive

Unit 233 Tractor Driving

Level: 2

Credit value: 5

Unit aim

This unit aims to provide learners with an understanding of the principles of tractor driving and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The aim of this unit is to provide learners with skills, knowledge and understanding to enable them to carry out tractor driving operations legally, safely and efficiently with the minimum of supervision.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know the key components and operator controls on a tractor
2. Know the relevant legislation and codes of practice for tractor driving
3. Be able to carry out simple maintenance tasks and settings to a tractor
4. Be able to operate tractor and attachments

Guided learning hours

It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU11 Preparation and operation of a tractor and attachments

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignments covering practical skills and underpinning knowledge.

Unit 233 Tractor Driving

Outcome 1 Know the key components and operator controls on a tractor

Assessment Criteria

The learner can:

1. Name the **key components** that make up the build of a current tractor
2. Identify and explain the purpose of all **controls and instrumentation** of a modern tractor

Range

As appropriate to area of study:

Agriculture - Currently available Tractors over 35Kw

All Terrain vehicles (ATVs)

Unit content

Key components

Power unit*:* guards and covers, fuel tank and filters, cooling system, radiator / fan, pressure cap, coolant, filter screens, oil level indicators and filter, battery, transmission gearbox, final drive and reductions, four wheel drive axle, wheels, tyres and brakes, hydraulic reservoir and filters, drawbar and hitch(es), external services, power take off

Controls and instrumentation

Controls*:* Operator ergonomics, safety start device, start/heat start switch, clutch(es), brakes, transmission controls, hydraulic controls, power take off controls, cab heating/conditioning, hazard/indicator switches, lighting switches, four wheel drive, differential lock

Instrumentation*:* Warning lights, audible warning signals, engine performance gauges,
Analogue, digital, LED formats, data/performance storage systems

Unit 233 Tractor Driving

Outcome 2 Know the relevant legislation and codes of practice for tractor driving

Assessment Criteria

The learner can:

1. Outline the **relevant legislation** that apply to tractor driving
2. Outline the relevant **codes of practice** that apply to tractor driving
3. Define the **limitations imposed on young or inexperienced tractor drivers**

Range

As appropriate to area of study:

Agriculture - Currently available Tractors over 35Kw

All Terrain vehicles (ATVs)

Unit content

Relevant legislations

Road Traffic Act 1984 (as amended 1991), Health and Safety at Work etc Act (1974) (HASWA), Provision and Use of Work Equipment Regulations (1998), Control of Noise at Work Regulations (2005), Environment Protection Act 1990 (as amended 1995), Construction and Use Regulations 1986

Codes of practice

Highway code, Manufacturers' recommendations, risk assessments, use of Personal Protective Equipment (PPE)

Limitations imposed on young or inexperienced tractor drivers

Insurance policy compliance, evidence of instruction and training, certification, operating on the land, road restrictions, licensing laws, weight restrictions

Unit 233 Tractor Driving

Outcome 3 Be able to carry out simple maintenance tasks and settings to a tractor

Assessment Criteria

The learner can:

1. Carry out **pre-start checks** on a tractor
2. Perform **pre-operational maintenance** tasks prior to undertaking tractor driving operations
3. Carry out **adjustments to the tractor to match the operator** to the tractor
4. **Prepare** the tractor to accept a range of selected **attachments**

Range

Agriculture - Currently available Tractors over 35Kw-
All Terrain vehicles (ATVs)

Unit content

Pre start checks

Fuel level, oil level, coolant level/air screens clear, tyre condition / inflation pressures, transmission oil level, clean windows and mirrors, loads and attachments secure, brake check, road legal lighting, horn, screen wash/wipe, insurance, taxation, safety guards

Pre-operational maintenance

Replenish engine, transmission and hydraulic oil levels, check air intake screens/pre cleaner condition, drain fuel water trap, replenish radiator coolant levels, and adjust tyre pressures, replenish screen wash, brake/clutch fluids

Adjustments to the tractor to match the operator

Seat fore-aft position, seat height, seat suspension, seat rotation for field work / fixed for road work, control panel/joystick adjustments, rear view mirrors, heat and air conditioning settings

Prepare the tractor to accept attachments

Trailed equipment:
Drawbar: length, height, offset, swing, jaws, suitable hitch pins, safe load limit
Automatic pick up hitch: wear on hitch components, hitch lock adjustment, safe load limit
Linkage mounted equipment: correct category, stabilisers, sway chains, top link position, front linkage, maximum height setting, speed of drop setting
Auxiliary fitment: counterweight, wheel ballast, hydraulic connentions, electrical connections, remote controls, lighting sockets, marker boards, wheel track widths, tyre pressures

Unit 233 Tractor Driving

Outcome 4 Be able to operate tractor and attachments

Assessment Criteria

The learner can:

1. Drive a tractor **safely and efficiently** around to meet given objectives
2. Safely **hitch** selected attachments to a tractor
3. **Operate tractors** and attachments safely to meet given objectives
4. Prepare tractors and attachments for **storage** ensuring they are ready for future use

Range

As appropriate to area of study:

Agriculture - Currently available tractors over 35Kw
- linkage and trailed attachments relating to the agricultural land-based industry

All Terrain vehicles (ATVs)

Unit content

Safely and efficiently

Assess risks, operator/bystander injuries, stock, obstructions, ground conditions, public access, fuel consumption, emissions, tyre wear, damage to equipment

Hitch procedures

Assess risks, power unit isolation, external hydraulic controls, stored energy release, correct use of jacks, parking stands, attachment adjustment, road transport/field work

Operate tractors

Correct starting, use of gears/speeds, power take off engagement, hydraulic control, electrical control, mechanical remote control, wet, dry and icy conditions, slopes, field procedures, tramlining, markers, global positioning system

Storage

Cleaning, decontamination, disconnection of attachments, refuelling, storage of linkage connectors, check on condition, reporting procedures

Unit 233 Tractor Driving

Notes for guidance

This unit is designed to give learners sufficient theoretical and practical instruction to gain the necessary underpinning knowledge and practical skills to operate tractors safely and economically. The tractors and equipment should cover a range that the learner would be expected to encounter in their area of study. Learners will need access to a range of tractors incorporating the level of technology expected of modern day equipment. When undertaking operational tasks it is essential that all activities are closely supervised and learners are able to assess hazards and risk for each task.

Health and safety - centres and tutors need to be aware of the requirement to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of machinery is involved. Legally, learners can drive a tractor from the age of 13 (around a farm/workplace but not on the public highway) therefore it is essential that they are properly trained in this area. The units in this qualification require the learner to undertake tractor driving under close supervision, and this is the same for any unit within the qualification that requires the learner to operate or use machinery. The HSE guidance INDG185 'Tractor Action – a step by step guide to using tractors safely' is highlighted in the guidance section for this unit and tutors and learners are encouraged to follow these safe guidelines for operation. Additionally The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

Outcome 1 requires learners to familiarise themselves with a range of tractors typically used in their area of learning, Learners should be able to recognise all components of the tractor which will need the attention of the operator prior to, during and after land based operations.
Learners will be able to identify and explain all controls and instruments on a range of modern tractors.

In Outcome 2 the learners must demonstrate awareness of legal aspects of tractor driving, both on the land and on the road. They must also be aware of codes of practice, which, if not followed, could lead to health and safety infringements, injuries, or damage to property and/or equipment.

In Outcome 3 the learners will need to carry out basic service tasks and pre start checks to ensure a tractor is safe, legal and ready carry out land-based operations.

Throughout the unit the emphasis will be on safe, legal practices, working to manufacturers' recommended procedures and attention to detail when recording information. Depending on the land-based area the learner is studying, formal lecture delivery may be generic to all areas but practical experiences and learning should be appropriate to the area of study.

In Outcome 4, learners will be able to demonstrate their ability to safely start and drive a tractor around a set course that will include forward and reverse manoeuvres, transmission ratio selection and correct power unit settings. Following positive outcome in this element the learner will be required to match tractor to identified machines and demonstrate safe hitching and operating techniques. It is expected that learners will then demonstrate knowledge and ability to prepare tractors and attachments for storage. At all stages of practical work, the learner must conform to legislations and safe working practices and beware of hazards and risks which may change during the tasks being carried out.

Learners will need access to a range of modern tractors and machines typically available to their area of study. Due to the complexity of many modern tractors it is essential that operations be closely supervised to ensure safety at all times.

References

Books

Bell B. 2005. *Farm Machinery*. Old Bond Publishing. ISBN: 1-903-36668-2.

Culpin C. 1992. *Farm Machinery, 12th edition.* Blackwell Science. ISBN: 0-632-03159-X.

Hawker M and Keelyside J**.** 1985. *Horticultural Machinery, 3rd edition.* Longman Higher Education. ISBN: 0-582-40807-5.

Journals

Farmers Weekly
Profi
Amenity Machinery and Equipment

Websites

www.hse.gov/pubns/indg185.pdf	Tractor Action
www.hse.gov.uk	Health and Safety Executive
www.roadtransport.com	Road Transport
www.direct.gov.uk/highwaycode	Public Services Website

Unit 234 Maintain Sports Turf Surfaces - Cricket

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of maintenance of sports turf - cricket and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop the skills and knowledge to maintain, renovate and present cricket surfaces and to use Performance Quality Standards to inform maintenance decisions and monitor the level of quality of surfaces.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to maintain cricket surfaces to sustain or improve the level of quality
2. Be able to renovate cricket surfaces to Performance Quality Standards
3. Understand the requirements for cricket surfaces
4. Be able to monitor and assess the level of quality of cricket surfaces

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

L5 Maintain the health of sports turf

L6 Present, maintain and repair sports turf surfaces for play

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC and the Institute of Groundsmanship.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 234 Maintain Sports Turf Surfaces - Cricket

Outcome 1 Be able to maintain cricket surfaces to sustain or improve the level of quality

Assessment Criteria

The learner can:

1. Maintain a **cricket pitch, square and outfield** safely and in a safe condition
2. **Measure and mark out** a cricket square, pitch and outfield
3. Set out **equipment and materials** required for the sport

Unit content

Cricket pitch, square and outfield

Assess the surface and undertake maintenance tasks (mowing, edging (if applicable where non-turf pitch is used), aeration, scarification, top dressing, rolling, turfing, seeding, irrigation, brushing/switching, fertilising), timing, equipment (pedestrian, ride-on and tractor mounted) mode of action (powered hand held, non-powered), materials (topdressing, seed, turf) and method of application, health and safety, risk assessment, Personal Protective Equipment (PPE), environmental good practice (minimisation of impacts)

Measure and mark out

Preparation of surface, machinery and equipment, initial setting of a cricket square and wicket, over-marking techniques, marking lines, marking materials and their storage, maintenance of sports equipment, dimensions, recommended gradients/tolerances

Equipment and materials

Stumps and bales, sightscreens, boundary markers, scoreboards

Unit 234 Maintain Sports Turf Surfaces - Cricket

Outcome 2 Be able to renovate cricket surfaces to Performance Quality Standards

Assessment Criteria

The learner can:

1. Identify and renovate **worn areas** of each cricket surface during the season
2. Carry out **early season activities** to bring the square into use
3. Carry out the required activities to **bring a pitch into use and renovate it** afterwards
4. Comply with **current legislation** when renovating and maintaining turf surfaces

Unit content

Worn areas

Bowler marks, wicket ends, renovation of pitches for later use during the season, localised areas of pest/disease damage

Preparation of area and renovation activities (to include mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding, overseeding, fertilising, irrigation), timing of operations

Early season activities

Mowing, pest, disease and moss control, levelling, re-seeding, rolling and irrigation, as required, gradual increase in the weight of the roller and decrease in the height of cut of the mower/rootzone moisture levels

Bring a pitch into use and renovate it

Mower with comb over whole table area. Close mowing, scarification/raking/brushing, rolling, crease marking, switching and irrigation if required, repair wickets as they come out of play. Level scars, over-seed or re-turf ends. At end of season raise the height of cut of mower, scarify and aerate the table, repair wicket ends and over-seed the whole table. Maintain the level of the pitch and apply overall top-dressing and work in

Current legislation

Health and Safety at Work etc Act 1974, Management of Health and Safety at Work Regulations 1992 (HASWA) (as amended 1999), Control of Substances Hazardous to Health Regulations 2002(COSSH), Food and Environment Protection Act 1985 (FEPA), Control of Pesticides Regulations 1986, Provision and Use of Work Equipment Regulations 1998 (PUWER)

Unit 234 Maintain Sports Turf Surfaces - Cricket

Outcome 3 Understand the requirements for cricket surfaces

Assessment Criteria

The learner can:

1. State the **objectives** of the range of activities used to prepare and maintain a cricket square, pitch and outfield
2. Identify Performance Quality Standards that are **particularly appropriate to cricket surfaces**
3. Explain the **benefits** of monitoring the quality of turf surfaces
4. State the **dimensions** of a cricket square, pitch and outfield

Unit content

Objectives

Improve or sustain presentational quality, structure, stability, carrying capacity, specific playing qualities

Particularly appropriate to cricket surfaces

Levels of Performance Quality Standards (basic, standard and high)
Structural: determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate
Presentational: appearance, visibility of and width of markings, surface debris, and sward colour
Playing: e.g. vertical ball bounce, traction, ball roll, spin, hardness

Benefits

Inform management decisions, determine maintenance requirement accurately, justify purchase of equipment/resources, effective use of inputs, reduced wastage, determine the carrying capacity of the turf

Dimensions

Junior, adult

Unit 234 Maintain Sports Turf Surfaces - Cricket

Outcome 4 Be able to monitor and assess the level of quality of cricket surfaces

Assessment Criteria

The learner can:

1. Use at least **16 appropriate Performance Quality Standards** to monitor the level of quality of cricket surfaces
2. **Interpret** the results of monitoring activities
3. Identify any **remedial action** that may be required

Unit content

16 appropriate Performance Quality Standards

Structural: determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate
Presentational: e.g. appearance, visibility of and width of markings, surface debris, and sward colour
Playing: e.g. vertical ball bounce, traction, ball roll, spin, hardness

Interpret

Interpret results and identify Performance Quality Standards level (basic, standard and high)

Remedial action

Identification of remedial action to bring the turf surface to the stated level of quality e.g. mowing, aeration/scarification, divotting, brushing, over-seeding, top dressing, marking, rolling, removal of debris

Unit 234 Maintain Sports Turf Surfaces - Cricket

Notes for guidance

This unit is designed to provide the learner with the sound knowledge and the skills required to maintain turf surfaces for cricket. They should be able to select and safely use appropriate machines, equipment and materials for these tasks. The unit should cover as wide a range of activities as possible, appropriate to the cricket grounds available to the learner.

Throughout the unit, the emphasis should be on safe working. It is expected that the learner may not be aware of basic safe working practices with turf maintenance machinery but is likely to be familiar with accepted practices and behaviours within the context in which they are working. It is a requirement for the learner to operate machinery, therefore health and safety issues relevant to the operation of the machinery used must be stressed and regularly reinforced. The learner should be actively involved in comprehensive risk assessments.

All equipment/machinery being used must comply with relevant requirements of the Provision and Use of Work Equipment Regulations (PUWER) 1998. Adequate Personal Protective Equipment (PPE) appropriate to the learner, the machinery and the task must be provided and worn in accordance with the associated risk assessment, industry guidance and operator's manual.

In Outcome 1 the learner will be required to maintain cricket surfaces to sustain or improve the level of quality. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments.

In Outcome 2 the learner will be required to renovate cricket surfaces to Performance Quality Standards. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should identify a minimum of 8 appropriate structural, 2 presentational and 2 playing qualities, out of a total of 16 performance quality standards that are appropriate to cricket surfaces.

In Outcome 3 the learner will understand the performance requirements for cricket surfaces. The learner should determine the range of activities commonly carried out, why they are important and how they impact upon the performance quality standards appropriate to cricket surfaces.

In Outcome 4 the learner will be required to monitor and assess the level of quality of cricket surfaces. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should identify a minimum of 8 appropriate structural, 2 presentational and 2 playing qualities, out of a total of 16 performance quality standards that are appropriate to cricket surfaces.

A learner working towards level 2 is likely to have some experience of practical sports turf activities. This unit aims to develop the learner's knowledge and skills involved with the safe use of sports turf machinery and equipment. Emphasis should be placed upon 'doing' and developing practical experience. The learner should be given appropriate time to develop their skills. It is important that the learner understands the importance of maintaining an awareness of current legislation and Codes of Practice in relation to turf maintenance and renovation operations for cricket.

Learners should have appropriate access to suitable cricket facilities for practical lessons and assessment. Where resources at the centre are limited, visits to cricket grounds would be useful to compliment lessons at

the centre. However, learners should have regular access for practical work on cricket grounds over at least one full season in order to develop their skills to the required level.

References

Books

Adams WA and Gibbs RJ. 1994. *Natural Turf for Sport and Amenity: Science and Practice*. Oxon: CAB International. ISBN: 0-851-98720-6.

Brown S. 2005. *Sports Turf and Amenity Grassland Management.* London: The Crowood Press. ISBN: 1-861-26790-8.

Brown S. 2009. *Sports Ground Management: A Complete Guide*. London: The Crowood Press. ISBN: 1-847-97094-X.

Evans RDC. 1991. *Cricket Grounds: The Evolution, Maintenance and Construction of Natural Turf Cricket Tables and Outfields.* Yorkshire: The Sports Turf Research Institute. ISBN: 1-873-43100-7.

Sachs P. 2004. *Managing Healthy Sports Fields.* Sussex: Wiley. ISBN: 0-471-47269-7.

Turgeon AJ. 2009. *Turfgrass Management.* 8th ed. Harlow: Pearson Education: 0-131-14000-0.

Websites

www.iog.org The Institute of Groundsmanship

Unit 235 Maintain Sports Turf Surfaces - Association Football

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of maintenance of sports turf - association football pitches and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop the skills and knowledge to maintain, renovate and present football pitches and to use Performance Quality Standards to inform maintenance decisions and monitor the level of quality of surfaces.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to maintain association football pitches to sustain or improve the level of quality
2. Be able to renovate association football pitches to Performance Quality Standards
3. Understand the requirements for association football pitches
4. Be able to monitor and assess the level of quality of association football pitches

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

L5 Maintain the health of sports turf

L6 Present, maintain and repair sports turf surfaces for play

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC and the Institute of Groundsmanship.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 235 Maintain Sports Turf Surfaces - Association Football

Outcome 1 Be able to maintain association football pitches to sustain or improve the level of quality

Assessment Criteria

The learner can:

1. Maintain an **association football pitch** safely
2. Demonstrate how to **measure and mark out** an association football pitch
3. Set out **equipment and materials** required for the sport.

Unit content

Association football pitch

Assess the surface and undertake maintenance tasks (mowing, aeration, scarification, top dressing, rolling, turfing, seeding, irrigation, brushing/switching, fertilising), timing, equipment (pedestrian, ride-on and tractor mounted) mode of action (powered hand held, non-powered), materials (topdressing, seed, turf) and method of application, irrigation, fertilisers, health and safety, risk assessment, Personal Protective Equipment (PPE), environmental good practice (minimisation of impacts)

Measure and mark out

Preparation of surface, machinery and equipment, initial setting out, over-marking techniques, marking lines, marking materials and their storage, maintenance of sports equipment, dimensions, recommended gradients/tolerances

Equipment and materials

Goals and corner flags

Unit 235 Maintain Sports Turf Surfaces - Association Football

Outcome 2 Be able to renovate association football pitches to Performance Quality Standards

Assessment Criteria

The learner can:

1. Identify and renovate **worn areas** of the pitch during the season
2. Carry out **off-season activities** to renovate the pitch
3. Comply with **current legislation** when renovating and maintaining turf surfaces

Unit content

Worn areas

Preparation of areas (goal areas, the diamond pattern, linesman's strips) and renovation activities (to include mowing, aeration/scarification, divotting, top-dressing, brushing, feeding, re-turfing, over-seeding, top dressing, overseeding), timing of operations

Off-season activities

Mowing, scarification, aeration, top-dressing, levelling, over-seeding, re-turfing, brushing, fertilising, irrigation

Current legislation

Health and Safety at Work etc Act 1974, Management of Health and Safety at Work Regulations 1992 (HASWA) (as amended 1999), Control of Substances Hazardous to Health Regulations 2002(COSSH), Food and Environment Protection Act 1985 (FEPA), Control of Pesticides Regulations 1986, Provision and Use of Work Equipment Regulations 1998 (PUWER)

Unit 235 Maintain Sports Turf Surfaces - Association Football

Outcome 3 Understand the requirements for association football pitches

Assessment Criteria

The learner can:

1. State the **objectives** of the range of activities used to prepare and maintain an association football pitch
2. Identify Performance Quality Standards that are **particularly appropriate to association football pitches**
3. Explain the **benefits** of monitoring the quality of turf surfaces
4. State the **dimensions** of a full-sized association football pitch

Unit content

Objectives

Improve or sustain presentational quality, structure, stability, carrying capacity, specific playing qualities

Particularly appropriate to association football pitches

Levels of Performance Quality Standards (basic, standard and high)
Structural: Determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate
Presentational: e.g. appearance, visibility of and width of markings, goal posts, surface debris, and sward colour
Playing: e.g. vertical ball bounce, traction, ball roll, hardness

Benefits

Inform management decisions, determine maintenance requirement accurately, justify purchase of equipment/resources, effective use of inputs, reduced wastage, determine the carrying capacity of the turf

Dimensions

Junior, adult

Unit 235 Maintain Sports Turf Surfaces - Association Football

Outcome 4 Be able to monitor and assess the level of quality of association football pitches

Assessment Criteria

The learner can:

1. Use at least **16 appropriate Performance Quality Standards** to monitor the level of quality of association football pitches
2. **Interpret** the results of monitoring activities
3. Identify any **remedial action** that may be required.

Unit content

16 appropriate Performance Quality Standards

Structural: determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate

Presentational: e.g. appearance, visibility of and width of markings, goal posts, surface debris, and sward colour

Playing: e.g. vertical ball bounce, traction, ball roll, hardness

Interpret

Interpret results and identify Performance Quality Standards level (basic, standard and high)

Remedial action

Identification of remedial action to bring the turf surface to the stated level of quality e.g. mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding, marking, rolling, removal of debris

Unit 235 Maintain Sports Turf Surfaces - Association Football

Notes for guidance

This unit is designed to provide the learner with the sound knowledge and the skills required to maintain turf surfaces for association football pitches. They should be able to select and safely use appropriate machines, equipment and materials for these tasks. The unit should cover as wide a range of activities as possible, appropriate to the association football pitches available to the learner.

Throughout the unit, the emphasis should be on safe working. It is expected that the learner may not be aware of basic safe working practices with turf maintenance machinery but is likely to be familiar with accepted practices and behaviours within the context in which they are working. It is a requirement for the learner to operate machinery therefore health and safety issues relevant to the operation of the machinery used must be stressed and regularly reinforced. The learner should be actively involved in comprehensive risk assessments.

All equipment/machinery being used must comply with relevant requirements of the Provision and Use of Work Equipment Regulations (PUWER) 1998. Adequate Personal Protective Equipment (PPE) appropriate to the learner, the machinery and the task must be provided and worn in accordance with the associated risk assessment, industry guidance and operator's manual.

In Outcome 1 the learner will be required to maintain association football pitches to sustain or improve the level of quality. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner must be able to mark out at least ¼ of a pitch and over-mark existing lines on a whole pitch. The learner must be able to lead and direct any helpers during marking out.

In Outcome 2 the learner will be required to renovate association football pitches to Performance Quality Standards. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should identify a minimum of 8 appropriate structural, 2 presentational and 2 playing qualities, out of a total of 16 performance quality standards that are appropriate to football surfaces.

In Outcome 3 the learner will understand the performance requirements for association football pitches. The learner should determine the range of activities commonly carried out, why they are important and how they impact upon the performance quality standards appropriate to football surfaces.

In Outcome 4 the learner will be required to monitor and assess the level of quality of association football pitches. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should use a minimum of 8 appropriate structural, 2 presentational and 2 playing qualities, out of a total of 16 performance quality standards that are appropriate to football surfaces.

A learner working towards level 2 is likely to have experience of practical sports turf activities. This unit aims to develop the learner's knowledge and skills involved with the safe use of sports turf machinery and equipment. Emphasis should be placed upon 'doing' and developing practical experience. The learner should be given appropriate time to develop their skills. It is important that the learner understands the importance of maintaining an awareness of current legislation and Codes of Practice in relation to turf maintenance and renovation operations for association football.

Learners should have appropriate access to suitable association football facilities for practical lessons and assessment. Where resources at the centre are limited, visits to football grounds would be useful to

complement lessons at the centre. However, the learners should have regular access for practical work on association football grounds over at least one full season in order to develop their skills to the required level.

References

Books

Adams WA and Gibbs RJ. 1994. *Natural Turf for Sport and Amenity: Science and Practice*. Oxon: CAB International. ISBN: 0-851-98720-6.

Brown S. 2005. *Sports Turf and Amenity Grassland Management.* London: The Crowood Press. ISBN: 1-861-26790-8.

Brown S. 2009. *Sports Ground Management: A Complete Guide*. London: The Crowood Press. ISBN: 1-847-97094-X.

Evans RDC. 1994. *Winter Games Pitches: The Construction and Maintenance of Natural Turf Pitches.* Yorkshire: The Sports Turf Research Institute. ISBN: 1-873-43103-1.

Sachs P. 2004. *Managing Healthy Sports Fields.* Sussex: Wiley. ISBN: 0-471-47269-7.

Turgeon AJ. 2009. *Turfgrass Management.* 8th ed. Harlow: Pearson Education: 0-131-14000-0.

Websites

www.iog.org The Institute of Groundsmanship

Unit 236 Maintain Sports Turf Surfaces - Golf

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of maintenance of sports turf - golf and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop the skills and knowledge to maintain, renovate and present golf surfaces and to use Performance Quality Standards to inform maintenance decisions and monitor the level of quality of surfaces.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to maintain golf surfaces to sustain or improve the level of quality
2. Be able to renovate golf surfaces to Performance Quality Standards
3. Understand the requirements for golf surfaces
4. Be able to monitor and assess the level of quality of golf surfaces

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

L5 Maintain the health of sports turf

L6 Present, maintain and repair sports turf surfaces for play

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC and the Institute of Groundsmanship.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 236 Maintain Sports Turf Surfaces - Golf

Outcome 1 Be able to maintain golf surfaces to sustain or improve the level of quality

Assessment Criteria

The learner can:

1. Select appropriate equipment and maintain **a golf green, tee and fairway** safely and in a safe condition
2. Cut a new hole on a green and repair the previous hole
3. Set out **equipment** required for golf and mark out-of-bounds

Unit content

A golf green, tee and fairway

Assess the surface and undertake maintenance tasks (mowing, edging (if applicable where non-turf surfaces are used), aeration, scarification, top dressing, rolling, turfing, seeding, irrigation, brushing/switching, fertilising), timing, equipment (pedestrian, ride-on and tractor mounted) mode of action (powered hand held; non-powered), materials (topdressing, seed, turf) and method of application, irrigation, fertilisers, health and safety, risk assessment, Personal Protective Equipment (PPE), environmental good practice (minimisation of impacts)

Equipment

Flags, tee markers, mark out-of-bounds, change the hole on a green, divot top-dressing

Unit 236 Maintain Sports Turf Surfaces - Golf

Outcome 2 Be able to renovate golf surfaces to Performance Quality Standards

Assessment Criteria

The learner can:

1. Identify and **renovate worn areas** of golf surfaces
2. Renovate a **golf bunker**
3. Comply with **current legislation** when renovating and maintaining turf surfaces

Unit content

Renovate worn areas

Localised areas of damage/ heavy wear, pitch marks, divots, damaged edges, localised areas of pest/disease damage, including mammals

Preparation of area and renovation activities (to include mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding, fertilising, irrigation, re-turfing, drag matting, verticutting), timing of operations

Golf bunker

Preparation of area and renovation activities (to include raking/topping up sand, edging/repair of turf edges, mowing) steep grass banks

Current legislation

Health and Safety at Work etc Act 1974, Management of Health and Safety at Work Regulations 1992 (HASWA) (as amended 1999), Control of Substances Hazardous to Health Regulations 2002(COSSH), Food and Environment Protection Act 1985 (FEPA), Control of Pesticides Regulations 1986, Provision and Use of Work Equipment Regulations 1998 (PUWER)

Unit 236 Maintain Sports Turf Surfaces - Golf

Outcome 3 Understand the requirements for golf surfaces

Assessment Criteria

The learner can:

1. State the **objectives** of the range of activities used to prepare and maintain golf surfaces to meet the needs of the sport and the environment
2. Identify Performance Quality Standards that are **particularly appropriate to golf surfaces**
3. Explain the **benefits** of monitoring the quality of turf surfaces
4. Explain the use of winter tees

Unit content

Objectives

Improve or sustain presentational quality, structure, stability, carrying capacity, specific playing qualities

Particularly appropriate to golf surfaces

Levels of Performance Quality Standards (basic, standard and high)
Structural: Determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, soil pH, infiltration rate
Presentational: e.g. appearance, surface debris, and sward colour
Playing: e.g. ball roll/green speed, traction, hardness

Benefits

Inform management decisions, determine maintenance requirement accurately, justify purchase of equipment/resources, effective use of inputs, reduced wastage, determine the carrying capacity of the turf

Unit 236 Maintain Sports Turf Surfaces - Golf

Outcome 4 Be able to monitor and assess the level of quality of golf surfaces

Assessment Criteria

The learner can:

1. Use at least **16 appropriate Performance Quality Standards** to monitor the level of quality of golf surfaces
2. **Interpret** the results of monitoring activities
3. Identify any **remedial action** that may be required.

Unit content

16 appropriate Performance Quality Standards

Structural: determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, soil pH, infiltration rate
Presentational: e.g. appearance, surface debris, and sward colour
Playing: e.g. ball roll/green speed, traction, hardness

Interpret

Interpret results and identify Performance Quality Standards level (basic, standard and high)

Remedial action

Identification of remedial action to bring the turf surface to the stated level of quality e.g. mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding, marking, rolling, removal of debris

Unit 236 Maintain Sports Turf Surfaces - Golf

Notes for guidance

This unit is designed to provide the learner with the sound knowledge and the skills required to maintain turf surfaces for golf. They should be able to select and safely use appropriate machines, equipment and materials for these tasks. The unit should cover as wide a range of activities as possible, appropriate to the golf courses available to the learner.

Throughout the unit, the emphasis should be on safe working. It is expected that the learner may not be aware of basic safe working practices with turf maintenance machinery but is likely to be familiar with accepted practices and behaviours within the context in which they are working. It is a requirement for the learner to operate machinery therefore health and safety issues relevant to the operation of the machinery used must be stressed and regularly reinforced. The learner should be actively involved in comprehensive risk assessments.

All equipment/machinery being used must comply with relevant requirements of the Provision and Use of Work Equipment Regulations (PUWER) 1998. Adequate Personal Protective Equipment (PPE) appropriate to the learner, the machinery and the task must be provided and worn in accordance with the associated risk assessment, industry guidance and operator's manual.

In Outcome 1 the learner will be required to maintain golf surfaces to sustain or improve the level of quality. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments.

In Outcome 2 the learner will be required to renovate golf surfaces to Performance Quality Standards. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should identify a minimum of 8 appropriate structural, 2 presentational and 2 playing qualities, out of a total of 16 performance quality standards that are appropriate to golf surfaces.

In Outcome 3 the learner will understand the performance requirements for golf surfaces. The learner should determine the range of activities commonly carried out, why they are important and how they impact upon the performance quality standards appropriate to golf surfaces.

In Outcome 4 the learner will be required to monitor and assess the level of quality of golf surfaces. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should use a minimum of 8 appropriate structural, 2 presentational and 2 playing qualities, out of a total of 16 performance quality standards that are appropriate to golf surfaces.

Learners should be able to maintain all types of turf on the golf course, but transferable skills, such as PQS assessment do not need to be assessed on each type of turf.

A learner working towards level 2 is likely to have some experience of practical sports turf activities. This unit aims to develop the learner's knowledge and skills involved with the safe use of sports turf machinery and equipment. Emphasis should be placed upon 'doing' and developing practical experience. The learner should be given appropriate time to develop their skills. It is important that the learner understands the importance of maintaining an awareness of current legislation and Codes of Practice in relation to turf maintenance and renovation operations.

Learners should have appropriate access to golf facilities for practical lessons and assessment. Where resources at the centre are limited, visits to golf courses would be useful to complement lessons at the

centre. However, the learners should have regular access for practical work on golf courses over at least one full season in order to develop their skills to the required level.

References

Books

Adams WA and Gibbs RJ. 1994. *Natural Turf for Sport and Amenity: Science and Practice*. Oxon: CAB International. ISBN: 0-851-98720-6.

Arthur J. 2003. *Practical Greenkeeping.* 2nd ed. Scotland: Royal & Ancient Golf Club of St Andrews. ISBN: 0-907-58312-1.

Baker, S. 2005. *STRI Guidelines to Golf Green Construction in the United Kingdom.* Yorkshire: The Sports Turf Research Institute. ISBN: 1-873-43159-7.

Brown S. 2005. *Sports Turf and Amenity Grassland Management.* London: The Crowood Press. ISBN: 1-861-26790-8.

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Sachs P. 2004. *Managing Healthy Sports Fields.* Sussex: Wiley. ISBN: 0-471-47269-7.

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Witteveen G and Bavier M. 2004. *Practical Golf Course Maintenance: The Magic of Greenkeeping.* 2nd ed. Sussex: John Wiley & Sons. ISBN: 0-471-47582-3.

Websites

www.iog.org The Institute of Groundsmanship

Unit 237 Maintain Sports Turf Surfaces - Horseracing

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of maintenance of sports turf - horseracing and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop the skills and knowledge to maintain, renovate and present horseracing surfaces and to use Performance Quality Standards to inform maintenance decisions and monitor the level of quality of surfaces.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to maintain horseracing surfaces to sustain or improve the level of quality
2. Be able to renovate horseracing surfaces to Performance Quality Standards
3. Understand the requirements for horseracing surfaces
4. Be able to monitor and assess the level of quality of horseracing surfaces

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

L5 Maintain the health of sports turf

L6 Present, maintain and repair sports turf surfaces for play

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC and the Institute of Groundsmanship.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 237 Maintain Sports Turf Surfaces - Horseracing

Outcome 1 Be able to maintain horseracing surfaces to sustain or improve the level of quality

Assessment Criteria

The learner can:

1. Select appropriate equipment and maintain **horseracing facilities** safely
2. Set out **equipment** required for horseracing, in line with Jockey Club General Instructions, Section 3, The Racecourse.

Unit content

Horseracing facilities

Assess the surface and undertake maintenance tasks (mowing, aeration, scarification, top dressing, rolling, turfing, seeding, irrigation, brushing/switching, fertilising), timing, equipment (pedestrian, ride-on and tractor mounted) mode of action (powered hand held, non-powered), materials (topdressing, seed, turf) and method of application, irrigation, fertilisers, re-positioning of running rails, fencing set out and prepared for the start of the event, health and safety, risk assessment, Personal Protective Equipment (PPE), environmental good practice (minimisation of impacts)

Equipment

Equipment: starting positions, furlong markers, marker poles, white tape, winning post, running rails, padding on running rail uprights, yellow bollards, mobile trestle, black and white hurdles, course direction H & C markers

Unit 237 Maintain Sports Turf Surfaces - Horseracing

Outcome 2 Be able to renovate horseracing surfaces to Performance Quality Standards

Assessment Criteria

The learner can:

1. Identify and **renovate worn areas** of horseracing surfaces
2. Carry out **off season activities** to renovate horseracing surfaces
3. Comply with **current legislation** when renovating and maintaining turf surfaces

Unit content

Renovate worn areas

Localised areas of damage/ heavy wear, divots, localised areas of pest/disease damage
Preparation of area and renovation activities (to include mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding, brushing/drag-matting), fertilising, irrigation, timing of operations

Off season activities

Overseeding, re-turfing, aerating, scarifying, top-dressing, divotting, brushing/drag-matting

Current legislation

Health and Safety at Work etc Act 1974, Management of Health and Safety at Work Regulations 1992 (HASWA) (as amended 1999), Control of Substances Hazardous to Health Regulations 2002(COSSH), Food and Environment Protection Act 1985 (FEPA), Control of Pesticides Regulations 1986, Provision and Use of Work Equipment Regulations 1998 (PUWER)

Unit 237 Maintain Sports Turf Surfaces - Horseracing

Outcome 3 Understand the requirements for horseracing surfaces

Assessment Criteria

The learner can:

1. State the **objectives** of the range of activities used to prepare and maintain horseracing surfaces to meet the needs of the sport and the environment
2. Identify Performance Quality Standards that are **particularly appropriate to horseracing surfaces** and the **benefits** of using them
3. State the **dimensions** of selected horseracing tracks.

Unit content

Objectives

Improve presentational quality, improve structure, improve stability, increase carrying capacity, improve specific racing qualities

Particularly appropriate to horseracing surfaces

Levels of Performance Quality Standards (basic, standard and high)
Structural: Determines racing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate
Presentational: e.g. appearance, surface debris, and sward colour
Racing: e.g. traction, hardness (the 'going')

Benefits

Inform management decisions, determine maintenance requirement accurately, justify purchase of equipment/resources, effective use of inputs, reduced wastage, determine the carrying capacity of the turf

Dimensions

Junior, adult

Unit 237 Maintain Sports Turf Surfaces - Horseracing

Outcome 4 Be able to monitor and assess the level of quality of horseracing surfaces

Assessment Criteria

The learner can:

1. Use at least **16 appropriate Performance Quality Standards** to monitor the level of quality of horseracing surfaces
2. **Interpret** the results of monitoring activities
3. Identify any **remedial action** that may be required.

Unit content

16 appropriate Performance Quality Standards

Structural: determines racing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate

Presentational: e.g. appearance, surface debris, and sward colour

Racing: e.g. traction, hardness ('the going')

Interpret

Interpret results and identify Performance Quality Standards level (basic, standard and high)

Remedial action

Identification of remedial action to bring the turf surface to the stated level of quality e.g. mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding, marking, rolling, removal of debris

Unit 237 Maintain Sports Turf Surfaces - Horseracing

Notes for guidance

This unit is designed to provide the learner with the sound knowledge and the skills required to maintain turf surfaces for horseracing. They should be able to select and safely use appropriate machines, equipment and materials for these tasks. The unit should cover as wide a range of activities as possible, appropriate to the horseracing surfaces available to the learner.

Throughout the unit, the emphasis should be on safe working. It is expected that the learner may not be aware of basic safe working practices with turf maintenance machinery but is likely to be familiar with accepted practices and behaviours within the context in which they are working. It is a requirement for the learner to operate machinery, therefore health and safety issues relevant to the operation of the machinery used must be stressed and regularly reinforced. The learner should be actively involved in comprehensive risk assessments.

All equipment/machinery being used must comply with relevant requirements of the Provision and Use of Work Equipment Regulations (PUWER) 1998. Adequate Personal Protective Equipment (PPE) appropriate to the learner, the machinery and the task must be provided and worn in accordance with the associated risk assessment, industry guidance and operator's manual.

In Outcome 1 the learner will be required to maintain horseracing surfaces to sustain or improve the level of quality. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. Tasks may be carried out for Flat or National Hunt racing as required.

In Outcome 2 the learner will be required to renovate horseracing surfaces to Performance Quality Standards. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should identify a minimum of 8 appropriate structural, 2 presentational and 2 racing qualities, out of a total of 16 performance quality standards that are appropriate to horseracing surfaces.

In Outcome 3 the learner will understand the performance requirements for horseracing surfaces. The learner should determine the range of activities commonly carried out, why they are important and how they impact upon the performance quality standards appropriate to horseracing surfaces.

In Outcome 4 the learner will be required to monitor and assess the level of quality of horseracing surfaces. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should use a minimum of 8 appropriate structural, 2 presentational and 2 racing qualities, out of a total of 16 performance quality standards that are appropriate to horseracing surfaces.

A learner working towards level 2 is likely to have some experience of practical sports turf activities. This unit aims to develop the learner's knowledge and skills involved with the safe use of sports turf machinery and equipment. Emphasis should be placed upon 'doing' and developing practical experience. The learner should be given appropriate time to develop their skills. It is important that the learner understands the importance of maintaining an awareness of current legislation and Codes of Practice in relation to turf maintenance and renovation operations.

Learners should have appropriate access to horseracing facilities for practical lessons and assessment. Where resources at the centre are limited, off-site visits would be useful to compliment lessons at the centre. However, the learners should have regular access for practical work on horseracing facilities over at least one full season in order to develop their skills to the required level.

References

Books

Adams WA and Gibbs RJ. 1994. *Natural Turf for Sport and Amenity: Science and Practice*. Oxon: CAB International. ISBN: 0-851-98720-6.

Brown S. 2005. *Sports Turf and Amenity Grassland Management.* London: The Crowood Press. ISBN: 1-861-26790-8.

Websites

www.iog.org The Institute of Groundsmanship

Unit 238 Maintain Sports Turf Surfaces - Bowling Greens

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of maintenance of sports turf - bowling greens and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop the skills and knowledge to maintain, renovate and present bowling greens and to use Performance Quality Standards to inform maintenance decisions and monitor the level of quality of surfaces.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to maintain bowling greens to sustain or improve the level of quality
2. Be able to renovate bowling greens to Performance Quality Standards
3. Understand the requirements for bowling green surfaces
4. Be able to monitor and assess the level of quality of bowling greens

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

L5 Maintain the health of sports turf

L6 Present, maintain and repair sports turf surfaces for play

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC and the Institute of Groundsmanship.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 238 Maintain Sports Turf Surfaces - Bowling Greens

Outcome 1 Be able to maintain bowling greens to sustain or improve the level of quality

Assessment Criteria

The learner can:

1. Maintain **bowling greens** safely and in a safe condition
2. Ensure the perimeter ditch is edged and clear of debris
3. Set out **equipment and materials** required for the sport.

Unit content

Bowling greens

Assess the surface and undertake maintenance tasks (mowing, edging (if applicable where non-turf pitch is used), aeration, scarification, top dressing, rolling, turfing, seeding, irrigation, brushing/switching, fertilising), timing, equipment (pedestrian, ride-on and tractor mounted) mode of action (powered hand held, non-powered), materials (topdressing, seed, turf) and method of application, irrigation, fertilisers, health and safety, risk assessment, Personal Protective Equipment (PPE), environmental good practice (minimisation of impacts)

Equipment and materials

Mats, scoreboards, chairs as appropriate

Unit 238 Maintain Sports Turf Surfaces - Bowling Greens

Outcome 2 Be able to renovate bowling greens to Performance Quality Standards

Assessment Criteria

The learner can:

1. Identify and renovate **worn areas** of the bowling green during the season
2. Carry out **early season activities** to bring the green into use
3. Carry out **late season activities to renovate the green** at the end of the season
4. Comply with **current legislation** when renovating and maintaining turf surfaces

Unit content

Worn areas

Localised areas of damage, damage edges, localised areas of pest/disease damage
Preparation of areas and renovation activities (to include mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding, fertilising, irrigation), timing of operations

Early season activities

Mowing, pest, disease and moss control, levelling, re-seeding, top-dressing, fertilising, rolling and irrigation, as required, gradual increase in the weight of the roller and decrease in the height of cut of the mower/rootzone moisture levels

Late season activities to renovate the green

Close mowing, scarification, aeration, top-dressing/brushing/levelling, over-seeding, switching and irrigation if required

Current legislation

Health and Safety at Work etc Act 1974, Management of Health and Safety at Work Regulations 1992 (HASWA) (as amended 1999), Control of Substances Hazardous to Health Regulations 2002(COSSH), Food and Environment Protection Act 1985 (FEPA), Control of Pesticides Regulations 1986, Provision and Use of Work Equipment Regulations 1998 (PUWER)

Unit 238 Maintain Sports Turf Surfaces - Bowling Greens

Outcome 3 Understand the requirements for bowling green surfaces

Assessment Criteria

The learner can:

1. State the **objectives** of the range of activities used to prepare and maintain a bowling green
2. Identify Performance Quality Standards that are **particularly appropriate to bowling greens**
3. Explain the **benefits** of monitoring the quality of turf surfaces
4. State the **dimensions** of full size flat and crown bowling greens.

Unit content

Objectives

Improve presentational quality, improve structure, improve stability, increase carrying capacity, improve specific playing qualities

Particularly appropriate to bowling greens

Levels of Performance Quality Standards (basic, standard and high)
Structural: determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate
Presentational: e.g. appearance, surface debris, and sward colour
Playing: e.g. ball roll, hardness, green speed

Benefits

Inform management decisions, determine maintenance requirement accurately, justify purchase of equipment/resources, effective use of inputs, reduced wastage, determine the carrying capacity of the turf

Dimensions

Junior, adult

Unit 238 Maintain Sports Turf Surfaces - Bowling Greens

Outcome 4 Be able to monitor and assess the level of quality of bowling greens

Assessment Criteria

The learner can:

1. Use at least **16 appropriate Performance Quality Standards** to monitor the level of quality of bowling greens
2. **Interpret** the results of monitoring activities
3. Identify any **remedial action** that may be required.

Unit content

16 appropriate Performance Quality Standards

Structural: determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate

Presentational: e.g. appearance, surface debris, and sward colour

Playing: e.g. ball roll, hardness, green speed

Interpret

Interpret results and identify Performance Quality Standards level (basic, standard and high)

Remedial action

Identification of remedial action to bring the turf surface to the stated level of quality e.g. mowing, aeration/scarification, divotting, brushing, over-seeding, top dressing, marking, rolling, removal of debris

Unit 238 Maintain Sports Turf Surfaces - Bowling Greens

Notes for guidance

This unit is designed to provide the learner with the sound knowledge and the skills required to maintain turf surfaces for bowling. They should be able to select and safely use appropriate machines, equipment and materials for these tasks. The unit should cover as wide a range of activities as possible, appropriate to the bowling greens available to the learner.

Throughout the unit, the emphasis should be on safe working. It is expected that the learner may not be aware of basic safe working practices with turf maintenance machinery but is likely to be familiar with accepted practices and behaviours within the context in which they are working. It is a requirement for the learner to operate machinery, therefore health and safety issues relevant to the operation of the machinery used must be stressed and regularly reinforced. The learner should be actively involved in comprehensive risk assessments.

All equipment/machinery being used must comply with relevant requirements of the Provision and Use of Work Equipment Regulations (PUWER) 1998. Adequate Personal Protective Equipment (PPE) appropriate to the learner, the machinery and the task must be provided and worn in accordance with the associated risk assessment, industry guidance and operator's manual.

In Outcome 1 the learner will be required to maintain bowling greens to sustain or improve the level of quality. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. Tasks maybe carried out on a flat or crown green.

In Outcome 2 the learner will be required to renovate bowling greens to Performance Quality Standards. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should identify a minimum of 8 appropriate structural, 2 presentational and 2 playing qualities, out of a total of 16 performance quality standards that are appropriate to bowling greens. Tasks maybe carried out on a flat or crown green.

In Outcome 3 the learner will understand the performance requirements for bowling greens. The learner should determine the range of activities commonly carried out, why they are important and how they impact upon the performance quality standards appropriate to bowling greens.

In Outcome 4 the learner will be required to monitor and assess the level of quality of bowling greens. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should use a minimum of 8 appropriate structural, 2 presentational and 2 playing qualities, out of a total of 16 performance quality standards that are appropriate to bowling greens. Tasks maybe carried out on a flat or crown green.

A learner working towards level 2 is likely to have some experience of practical sports turf activities. This unit aims to develop the learner's knowledge and skills involved with the safe use of sports turf machinery and equipment. Emphasis should be placed upon 'doing' and developing practical experience. The learner should be given appropriate time to develop their skills. It is important that the learner understands the importance of maintaining an awareness of current legislation and Codes of Practice in relation to turf maintenance and renovation operations.

Learners should have appropriate access to suitable bowling greens/ very fine turf for practical lessons and assessment. Where resources at the centre are limited, visits to bowling greens would be useful to

compliment lessons at the centre. However, the learners should have regular access for practical work on bowling greens over at least one full season in order to develop their skills to the required level.

References

Books

Adams WA and Gibbs RJ. 1994. *Natural Turf for Sport and Amenity: Science and Practice*. Oxon: CAB International. ISBN: 0-851-98720-6.

Brown S. 2005. *Sports Turf and Amenity Grassland Management.* London: The Crowood Press. ISBN: 1-861-26790-8.

Brown S. 2009. *Sports Ground Management: A Complete Guide*. London: The Crowood Press. ISBN: 1-847-97094-X.

Perris J. 2008. *All About Bowls: The History, Construction and Maintenance of Bowling.* 3rd ed. Yorkshire: The Sports Turf Research Institute. ISBN: 1-873-43106-6.

Sachs P. 2004. *Managing Healthy Sports Fields.* Sussex: Wiley. ISBN: 0-471-47269-7.

Turgeon AJ. 2009. *Turfgrass Management.* 8th ed. Harlow: Pearson Education: 0-131-14000-0.

Websites

www.iog.org The Institute of Groundsmanship

Unit 239 Maintain Sports Turf Surfaces - Rugby Pitches

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of maintenance of sports turf - rugby pitches and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop the skills and knowledge to maintain, renovate and present rugby pitches and to use Performance Quality Standards to inform maintenance decisions and monitor the level of quality of surfaces.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to maintain rugby pitches to sustain or improve the level of quality
2. Be able to renovate rugby pitches to Performance Quality Standards
3. Understand the requirements for rugby pitches
4. Be able to monitor and assess the level of quality of rugby pitches

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

L5 Maintain the health of sports turf

L6 Present, maintain and repair sports turf surfaces for play

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC and the Institute of Groundsmanship.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 239 Maintain Sports Turf Surfaces - Rugby Pitches

Outcome 1 Be able to maintain rugby pitches to sustain or improve the level of quality

Assessment Criteria

The learner can:

1. Maintain a **rugby pitch** safely and in a safe condition
2. Demonstrate how to **measure and mark out** a rugby pitch
3. Set out **equipment and materials** required for the sport.

Unit content

Rugby pitch

Assess the surface and undertake maintenance tasks: mowing, edging (if applicable where non-turf pitch is used), aeration, scarification, top dressing, rolling, turfing, seeding, irrigation, brushing/switching, fertilising), timing, equipment (pedestrian, ride-on and tractor mounted) mode of action (powered hand held, non-powered), materials (topdressing, seed, turf) and method of application, irrigation, fertilisers, health and safety, risk assessment, Personal Protective Equipment (PPE), environmental good practice (minimisation of impacts)

Measure and mark out

Preparation of surface, machinery and equipment, initial setting out of a rugby pitch, over-marking techniques, marking lines, marking materials and their storage, maintenance of sports equipment, dimensions, recommended gradients/tolerances

Equipment and materials

Corner flags

Unit 239 Maintain Sports Turf Surfaces - Rugby Pitches

Outcome 2 Be able to renovate rugby pitches to Performance Quality Standards

Assessment Criteria

The learner can:

1. Identify and renovate **worn areas** of the pitch during the season
2. Carry out **off-season activities** to renovate the pitch
3. Comply with **current legislation** when renovating and maintaining turf surfaces.

Unit content

Worn areas

Preparation of areas and renovation activities (to include mowing, aeration/scarification, divotting, brushing, over-seeding, top dressing, fertilising, irrigation), timing of operations

Off-season activities

Mowing, scarification, aeration, top-dressing, levelling, over-seeding, re-turfing, brushing

Current legislation

Health and Safety at Work etc Act 1974, Management of Health and Safety at Work Regulations 1992 (HASWA) (as amended 1999), Control of Substances Hazardous to Health Regulations 2002(COSSH), Food and Environment Protection Act 1985 (FEPA), Control of Pesticides Regulations 1986, Provision and Use of Work Equipment Regulations 1998 (PUWER)

Unit 239 Maintain Sports Turf Surfaces - Rugby Pitches

Outcome 3 Understand the requirements for rugby pitches

Assessment Criteria

The learner can:

1. State the **objectives** of the range of activities used to prepare and maintain an rugby pitch
2. Identify Performance Quality Standards that are **particularly appropriate to rugby pitches**
3. Explain the **benefits** of monitoring the quality of turf surfaces
4. State the **dimensions** of a full sized rugby pitch

Unit content

Objectives

Improve or sustain presentational quality, structure, stability, carrying capacity, specific playing qualities

Particularly appropriate to rugby pitches

Levels of Performance Quality Standards (basic, standard and high)

Structural: Determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate

Presentational: e.g. appearance, visibility of and width of markings, surface debris, and sward colour

Playing: e.g. vertical ball bounce, traction, hardness

Benefits

Inform management decisions, determine maintenance requirement accurately, justify purchase of equipment/resources, effective use of inputs, reduced wastage, determine the carrying capacity of the turf

Dimensions

Junior, adult

Unit 239 Maintain Sports Turf Surfaces - Rugby Pitches

Outcome 4 Be able to monitor and assess the level of quality of rugby pitches

Assessment Criteria

The learner can:

1. Use at least **16 appropriate Performance Quality Standards** to monitor the level of quality of rugby pitches
2. **Interpret** the results of monitoring activities
3. Identify any **remedial action** that may be required

Unit content

16 appropriate Performance Quality Standards

Structural: determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate

Presentational: e.g. appearance, visibility of and width of markings, surface debris, and sward colour

Playing: e.g. vertical ball bounce, traction, hardness

Interpret

Interpret results and identify Performance Quality Standards level (basic, standard and high)

Remedial action

Identification of remedial action to bring the turf surface to the stated level of quality e.g. mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding, marking, rolling, removal of debris

Unit 239 Maintain Sports Turf Surfaces - Rugby Pitches

Notes for guidance

This unit is designed to provide the learner with the sound knowledge and the skills required to maintain turf surfaces for rugby. They should be able to select and safely use appropriate machines, equipment and materials for these tasks. The unit should cover as wide a range of activities as possible, appropriate to the rugby pitches available to the learner.

Throughout the unit, the emphasis should be on safe working. It is expected that the learner may not be aware of basic safe working practices with turf maintenance machinery but is likely to be familiar with accepted practices and behaviours within the context in which they are working. It is a requirement for the learner to operate machinery, therefore health and safety issues relevant to the operation of the machinery used must be stressed and regularly reinforced. The learner should be actively involved in comprehensive risk assessments.

All equipment/machinery being used must comply with relevant requirements of the Provision and Use of Work Equipment Regulations (PUWER) 1998. Adequate Personal Protective Equipment (PPE) appropriate to the learner, the machinery and the task must be provided and worn in accordance with the associated risk assessment, industry guidance and operator's manual.

In Outcome 1 the learner will be required to maintain rugby pitches to sustain or improve the level of quality. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner must mark out at least ¼ of a rugby pitch and over-mark existing lines on a whole rugby pitch. The learner must be able to lead and direct any helpers during marking out. Tasks can be carried out for Rugby Union or Rugby League pitches.

In Outcome 2 the learner will be required to renovate rugby pitches to Performance Quality Standards. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should identify a minimum of 8 appropriate structural, 2 presentational and 2 playing qualities, out of a total of 16 performance quality standards that are appropriate to rugby pitches.

In Outcome 3 the learner will understand the performance requirements for rugby pitches. The learner should determine the range of activities commonly carried out, why they are important and how they impact upon the performance quality standards appropriate to rugby pitches.

In Outcome 4 the learner will be required to monitor and assess the level of quality of rugby pitches. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should use a minimum of 8 appropriate structural, 2 presentational and 2 playing qualities, and a total of 16 performance quality standards that are appropriate to rugby pitches.

A learner working towards level 2 is likely to have some experience of practical sports turf activities. This unit aims to develop the learner's knowledge and skills involved with the safe use of sports turf machinery and equipment. Emphasis should be placed upon 'doing' and developing practical experience. The learner should be given appropriate time to develop their skills. It is important that the learner understands the importance of maintaining an awareness of current legislation and Codes of Practice in relation to turf maintenance and renovation operations.

Learners should have appropriate access to suitable rugby/winter sports facilities for practical lessons and assessment. Where resources at the centre are limited, visits to rugby grounds would be useful to

compliment lessons at the centre. However, the learners should have regular access for practical work on rugby/winter sports grounds over at least one full season in order to develop their skills to the required level.

References

Books

Adams WA and Gibbs RJ. 1994. *Natural Turf for Sport and Amenity: Science and Practice*. Oxon: CAB International. ISBN: 0-851-98720-6.

Brown S. 2005. *Sports Turf and Amenity Grassland Management.* London: The Crowood Press. ISBN: 1-861-26790-8.

Brown S. 2009. *Sports Ground Management: A Complete Guide*. London: The Crowood Press. ISBN: 1-847-97094-X.

Evans RDC. 1994. *Winter Games Pitches: The Construction and Maintenance of Natural Turf Pitches.* Yorkshire: The Sports Turf Research Institute. ISBN: 1-873-43103-1.

Sachs P. 2004. *Managing Healthy Sports Fields.* Sussex: Wiley. ISBN: 0-471-47269-7.

Turgeon AJ. 2009. *Turfgrass Management.* 8th ed. Harlow: Pearson Education: 0-131-14000-0.

Websites

www.iog.org The Institute of Groundsmanship

Unit 240 Maintain Sports Turf Surfaces - Tennis

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of maintenance of sports turf - tennis and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop the skills and knowledge to maintain, renovate and present tennis courts and to use Performance Quality Standards to inform maintenance decisions and monitor the level of quality of surfaces.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to maintain tennis courts to sustain or improve the level of quality
2. Be able to renovate tennis courts to Performance Quality Standards
3. Understand the requirements for tennis courts
4. Be able to monitor and assess the level of quality of tennis courts

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

L5 Maintain the health of sports turf

L6 Present, maintain and repair sports turf surfaces for play

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC and the Institute of Groundsmanship.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 240 Maintain Sports Turf Surfaces - Tennis

Outcome 1 Be able to maintain tennis courts to sustain or improve the level of quality

Assessment Criteria

The learner can:

1. Maintain **tennis courts** safely and in a safe condition
2. **Measure and mark out** a tennis court
3. Set out **equipment and materials** required for the sport.

Unit content

Tennis courts

Assess the surface and undertake maintenance tasks (mowing, edging (if applicable where non-turf pitch is used) aeration, scarification, top dressing, rolling, turfing, seeding, irrigation, brushing/switching, fertilising), timing, equipment (pedestrian, ride-on and tractor mounted) mode of action (powered hand held, non-powered), materials (topdressing, seed, turf) and method of application, irrigation, fertilisers, health and safety, risk assessment, Personal Protective Equipment (PPE), environmental good practice (minimisation of impacts)

Measure and mark out

Preparation of surface, machinery and equipment, initial setting out of a tennis court, over-marking techniques, marking lines, marking materials and their storage , maintenance of sports equipment, dimensions, recommended gradients/tolerances

Equipment and materials

Nets, posts, covers, umpire's chair, chairs for players and line judges, as required

Unit 240 Maintain Sports Turf Surfaces - Tennis

Outcome 2 Be able to renovate tennis courts to Performance Quality Standards

Assessment Criteria

The learner can:

1. Identify and renovate **worn areas** of the tennis court during the season
2. Carry out **early season activities** to bring the court into use
3. Carry out **late season activities to renovate the tennis court** at the end of the season
4. Comply with **current legislation** when renovating and maintaining turf surfaces

Unit content

Worn areas

Preparation of areas (e.g. base lines) and renovation activities (to include mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding, fertilising, irrigation), timing of operations

Early season activities

Mowing, pest, disease and moss control, levelling, top-dressing, scarification, rolling and watering, as required, gradual increase in the weight of the roller and decrease the height of cut of the mower

Late season activities to renovate the tennis court

At end of season raise the height of cut of mower, scarify and aerate the court, repair worn areas. Maintain the level and apply overall top-dressing and work in, over-seed the whole court.

Current legislation

Health and Safety at Work etc Act 1974, Management of Health and Safety at Work Regulations 1992 (HASWA) (as amended 1999), Control of Substances Hazardous to Health Regulations 2002(COSSH), Food and Environment Protection Act 1985 (FEPA), Control of Pesticides Regulations 1986, Provision and Use of Work Equipment Regulations 1998 (PUWER)

Unit 240 Maintain Sports Turf Surfaces - Tennis

Outcome 3 Understand the requirements for tennis courts

Assessment Criteria

The learner can:

1. State the **objectives** of the range of activities used to prepare and maintain a tennis court
2. Identify Performance Quality Standards that are **particularly appropriate to tennis courts**
3. Explain the **benefits** of monitoring the quality of turf surfaces
4. State the **dimensions** of singles and doubles tennis courts

Unit content

Objectives

Improve or sustain presentational quality, structure, stability, carrying capacity, specific playing qualities

Particularly appropriate to tennis courts

Levels of Performance Quality Standards (basic, standard and high)
Structural: Determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate
Presentational: e.g. appearance, visibility of and width of markings, surface debris, and sward colour
Playing: e.g. vertical ball bounce, traction, ball roll, spin, hardness

Benefits

Inform management decisions, determine maintenance requirement accurately, justify purchase of equipment/resources, effective use of inputs, reduced wastage, determine the carrying capacity of the turf

Dimensions

Junior, adult

Unit 240 Maintain Sports Turf Surfaces - Tennis

Outcome 4 Be able to monitor and assess the level of quality of tennis courts

Assessment Criteria

The learner can:

1. Use at least **16 appropriate Performance Quality Standards** to monitor the level of quality of tennis courts
2. **Interpret** the results of monitoring activities
3. Identify any **remedial action** that may be required.

Unit content

16 appropriate Performance Quality Standards

Structural: determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate
Presentational: e.g. appearance, visibility of and width of markings, surface debris, and sward colour
Playing: e.g. vertical ball bounce, traction, ball roll, spin, hardness

Interpret

Interpret results and identify Performance Quality Standards level (basic, standard and high)

Remedial action

Identification of remedial action to bring the turf surface to the stated level of quality e.g. mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding, marking, rolling, removal of debris

Unit 240 Maintain Sports Turf Surfaces - Tennis

Notes for guidance

This unit is designed to provide the learner with the sound knowledge and the skills required to maintain turf surfaces for tennis. They should be able to select and safely use appropriate machines, equipment and materials for these tasks. The unit should cover as wide a range of activities as possible, appropriate to the tennis courts available to the learner.

Throughout the unit, the emphasis should be on safe working. It is expected that the learner may not be aware of basic safe working practices with turf maintenance machinery but is likely to be familiar with accepted practices and behaviours within the context in which they are working. It is a requirement for the learner to operate machinery therefore health and safety issues relevant to the operation of the machinery used must be stressed and regularly reinforced. The learner should be actively involved in comprehensive risk assessments.

All equipment/machinery being used must comply with relevant requirements of the Provision and Use of Work Equipment Regulations (PUWER) 1998. Adequate Personal Protective Equipment (PPE) appropriate to the learner, the machinery and the task must be provided and worn in accordance with the associated risk assessment, industry guidance and operator's manual.

In Outcome 1 the learner will be required to maintain tennis courts to sustain or improve the level of quality. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments.

In Outcome 2 the learner will be required to renovate tennis courts to Performance Quality Standards. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should identify a minimum of 8 appropriate structural, 2 presentational and 2 playing qualities, out of a total of 16 performance quality standards that are appropriate to tennis courts.

In Outcome 3 the learner will understand the requirements for tennis courts. The learner should determine the range of activities commonly carried out, why they are important and how they impact upon the performance quality standards appropriate to tennis courts.

In Outcome 4 the learner will be required to monitor and assess the level of quality of tennis courts. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should use a minimum of 8 appropriate structural, 2 presentational and 2 playing qualities, out of a total of 16 performance quality standards that are appropriate to tennis courts.

A learner working towards level 2 is likely to have some experience of practical sports turf activities. This unit aims to develop the learner's knowledge and skills involved with the safe use of sports turf machinery and equipment. Emphasis should be placed upon 'doing' and developing practical experience. The learner should be given appropriate time to develop their skills. It is important that the learner understands the importance of maintaining an awareness of current legislation and Codes of Practice in relation to turf maintenance and renovation operations.

Learners should have appropriate access to suitable tennis facilities for practical lessons and assessment. Where resources at the centre are limited, visits to tennis courts would be useful to compliment lessons at the centre. However, the learners should have regular access for practical work on tennis courts over at least one full season in order to develop their skills to the required level.

References

Books

Adams WA and Gibbs RJ. 1994. *Natural Turf for Sport and Amenity: Science and Practice*. Oxon: CAB International. ISBN: 0-851-98720-6.

Brown S. 2005. *Sports Turf and Amenity Grassland Management.* London: The Crowood Press. ISBN: 1-861-26790-8.

Brown S. 2009. *Sports Ground Management: A Complete Guide*. London: The Crowood Press. ISBN: 1-847-97094-X.

Perris J. 2000. *Grass Tennis Courts: How to Construct and Maintain Them.* Yorkshire: The Sports Turf Research Institute. ISBN: 1-873-43134-1.

Sachs P. 2004. *Managing Healthy Sports Fields.* Sussex: Wiley. ISBN: 0-471-47269-7.

Turgeon AJ. 2009. *Turfgrass Management.* 8th ed. Harlow: Pearson Education: 0-131-14000-0.

Websites

www.iog.org The Institute of Groundsmanship

Unit 241 Maintain Turf in Amenity Horticulture

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of maintenance of turf in amenity horticulture and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop the skills and knowledge to maintain, renovate and present amenity turf and to use Performance Quality Standards to inform maintenance decisions and monitor the level of quality of surfaces.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to maintain fine and coarse amenity turf surfaces to sustain or improve the level of quality
2. Be able renovate amenity turf surfaces to Performance Quality Standards
3. Understand the requirements for amenity turf surfaces
4. Be able to monitor and assess the level of quality of amenity turf surfaces

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

L3 Maintain general amenity turf
CU 76 Maintain plants outdoors

Endorsement of the unit by a sector or other appropriate

This unit is endorsed by Lantra SSC and the Institute of Groundsmanship.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 241 Maintain Turf in Amenity Horticulture

Outcome 1 Be able to maintain fine and coarse amenity turf surfaces to sustain or improve the level of quality

Assessment Criteria

The learner can:

1. Maintain a range of **fine and coarse** amenity turf surfaces as identified in BS 7370-3

Unit content

Fine and coarse

Assess amenity turf surfaces e.g. measurements of height of vegetation, assessment of evenness, estimating the percentage ground cover of range of components, measurement of root and root zone depth, measurement of infiltration rate

Carry out appropriate maintenance activities (to include at least mowing, aeration and scarification), select appropriate equipment, comply with current legislation, particularly in respect of health and safety and environmental legislation

Unit 241 Maintain Turf in Amenity Horticulture

Outcome 2 Be able renovate amenity turf surfaces to Performance Quality Standards

Assessment Criteria

The learner can:

1. Identify and renovate **worn areas** of amenity turf
2. Comply with **legislation** when renovating and maintaining turf surfaces

Unit content

Worn areas

Identify worn amenity turf resulting from special events, day -to-day traffic across turf areas, bare patches, broken edges, tyre ruts

Preparation of area and renovation (to include mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding,), autumn versus spring renovation

Legislation

Health and Safety at Work etc Act 1974, Management of Health and Safety at Work Regulations 1992 (HASWA) (as amended 1999), Control of Substances Hazardous to Health Regulations 2002(COSSH), Food and Environment Protection Act 1985 (FEPA), Control of Pesticides Regulations 1986, Provision and Use of Work Equipment Regulations 1998 (PUWER)

Unit 241 Maintain Turf in Amenity Horticulture

Outcome 3 Understand the requirements for amenity turf surfaces

Assessment Criteria

The learner can:

1. State the **objectives** of the range of activities used to prepare and maintain amenity turf surfaces for specific purposes
2. Identify Performance Quality Standards that are **particularly appropriate to amenity turf surfaces**
3. Explain the **benefits** of monitoring the quality of turf surfaces
4. Explain how to renovate turf areas after their use for **marquees or temporary buildings**

Unit content

Objectives

Improve presentational quality, improve structure, improve stability, increase carrying capacity, improve specific playing qualities

Particularly appropriate to amenity turf surfaces

Levels of Performance Quality Standards (basic, standard and high)
Structural: determines amenity quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate
Presentational: e.g. appearance, surface debris, and sward colour

Benefits

Inform management decisions, determine maintenance requirement accurately, justify purchase of equipment/resources, effective use of inputs, reduced wastage, determine the carrying capacity of the turf

Marquees or temporary buildings

Mowing, watering, possibly with a wetting agent added, scarification to remove dead material, fertilising, seeding, top-dressing, aeration if required to relieve compaction

Unit 241 Maintain Turf in Amenity Horticulture

Outcome 4 Be able to monitor and assess the level of quality of amenity turf surfaces

Assessment Criteria

The learner can:

1. Use at least **16 appropriate Performance Quality Standards** to monitor the level of quality of amenity turf surfaces
2. **Interpret** the results of monitoring activities
3. Identify any **remedial action** that may be required

Unit content

16 appropriate Performance Quality Standards

Structural: e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate
Presentational: e.g. appearance, surface debris, and sward colour

Interpret

Interpret results and identify Performance Quality Standards level: basic (recreational use), standard (general club use) and high (professional and international use)

Remedial action

Identification of remedial action to bring the turf surface to the stated level of quality e.g. mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding, marking, rolling, removal of debris

Unit 241 Maintain Turf in Amenity Horticulture

Notes for guidance

This unit is designed to provide the learner with the sound knowledge and the skills required to maintain and renovate amenity turf surfaces. They should be able to select and safely use appropriate machines, equipment and materials for these tasks. The unit should cover as wide a range of activities as possible, appropriate to the sports turf sites available to the learner.

Throughout the unit, the emphasis should be on safe working. It is expected that the learner may not be aware of basic safe working practices with turf maintenance machinery but is likely to be familiar with accepted practices and behaviours within the context in which they are working. It is a requirement for the learner to operate machinery therefore health and safety issues relevant to the operation of the machinery used must be stressed and regularly reinforced. The learner should be actively involved in comprehensive risk assessments.

All equipment/machinery being used must comply with relevant requirements of the Provision and Use of Work Equipment Regulations (PUWER) 1998. Adequate Personal Protective Equipment (PPE) appropriate to the learner, the machinery and the task must be provided and worn in accordance with the associated risk assessment, industry guidance and operator's manual.

In Outcome 1 the learner will be required to maintain fine and coarse amenity turf surfaces to sustain or improve the level of quality with regard to BS 7370-3; 1991. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments.

In Outcome 2 the learner will be required to renovate amenity turf surfaces to Performance Quality Standards. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments.

In Outcome 3 the learner will understand requirements for amenity turf surfaces. The learner should determine the range of activities commonly carried out, why they are important and how they impact upon the performance quality standards. The learner should identify a total of 16 performance quality standards that are appropriate to 2 specific amenity turf surfaces.

In Outcome 4 the learner will be required to monitor and assess the level of quality of amenity turf surfaces. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should use a total of 16 performance quality standards that are appropriate to TWO specific amenity turf surfaces.

A learner working towards level 2 is likely to have some experience of practical sports turf activities. This unit aims to develop the learner's knowledge and skills involved with the safe use of sports turf machinery and equipment. Emphasis should be placed upon 'doing' and developing practical experience. The learner should be given appropriate time to develop their skills. It is important that the learner understands the importance of maintaining an awareness of current legislation and Codes of Practice in relation to turf maintenance and renovation operations.

Learners should have appropriate access to suitable fine and coarse amenity turf areas for practical lessons and assessment. Where resources at the centre are limited, visits to parks and gardens would be useful to complement lessons at the centre. However, the learners should have regular access for practical work on amenity surfaces over at least one full season in order to develop their skills to the required level.

References

Books

Adams WA and Gibbs RJ. 1994. *Natural Turf for Sport and Amenity: Science and Practice.* CAB International. ISBN: 0-851-98720-6.

Brown S. 2005. *Sports Turf and Amenity Grassland Management*. The Crowood Press.
ISBN: 1-861-26790-8.

Turgeon AJ. 2005. *Turfgrass Management*. Prentice Hall. ISBN: 0-131-14000-0.

BS 7370-3:1991 Grounds maintenance – Part 3: Recommendations for maintenance of amenity and functional turf (other than sports turf)

Websites

www.iog.org The Institute of Groundsmanship

Unit 242 Maintain Winter and Summer Sports Turf Surfaces

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of maintenance of winter and summer sports turf and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop the skills and knowledge to maintain, renovate and present winter and summer sports surfaces and to use Performance Quality Standards to inform maintenance decisions and monitor the level of quality of surfaces.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to maintain and renovate winter sports surfaces to sustain or improve the level of quality
2. Be able to maintain and renovate summer sports surfaces to sustain or improve the level of quality
3. Understand the requirements for specific sports surfaces
4. Be able to monitor and assess the level of quality of sports surfaces

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

L5 Maintain the health of sports turf

L6 Present, maintain and repair sports turf surfaces for play

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC and the Institute of Groundsmanship.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 242 Maintain Winter and Summer Sports Turf Surfaces

Outcome 1 Be able to maintain and renovate winter sports surfaces to sustain or improve the level of quality

Assessment Criteria

The learner can:

1. Maintain **winter pitches** safely using trailed, mounted or ride-on equipment
2. Demonstrate how to **measure and mark out** a winter sports pitch
3. Set out equipment and materials required for the sport
4. Carry out **renovation activities** to winter sports pitches safely.

Unit content

Winter pitches

Assess the surface and undertake maintenance tasks (mowing, edging, aeration, scarification, top dressing, turfing, seeding, irrigation, brushing/switching, fertilising), timing, equipment (pedestrian, ride-on and tractor mounted) mode of action (powered hand held, non-powered), materials (topdressing, seed, turf) and method of application, irrigation, fertilisers), comply with current legislation

Measure and mark out

Preparation of surface, machinery and equipment, over-marking techniques, marking lines, marking materials and their storage, maintenance of sports equipment, pitch dimensions (junior, senior, national, international), recommended gradients/tolerances for pitches and surfaces

Renovation activities

Preparation of area and renovation (to include mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding), autumn versus spring renovation

Unit 242 Maintain Winter and Summer Sports Turf Surfaces

Outcome 2 Be able to maintain and renovate summer sports surfaces to sustain or improve the level of quality

Assessment Criteria

The learner can:

1. Mow summer sports surfaces safely with **pedestrian operated equipment**
2. **Prepare a summer sports surface** ready for play
3. Scarify, aerate and top-dress a **summer sports surface** safely
4. **Repair summer pitches** by over-seeding and patching
5. Comply with **current legislation** when renovating and maintaining turf surfaces.

Unit content

Pedestrian operated equipment

Select appropriate equipment (e.g. cylinder mower), health and safety, risk assessment, Personal Protective Equipment (PPE), environmental good practice (minimisation of impacts)

Prepare a summer sports surface

Select appropriate operations and equipment required to prepare a summer sports surface for play (e.g. setting and marking out, goal posts, flags)

Summer sports surface

Identification of areas to be worked, selection of appropriate technique, timing, health and safety, PPE

Repair summer sports surfaces

Identification of areas to be repaired, selection of appropriate technique, timing, repair (over-seeding and patching), turf levelling

Current legislation

Health and Safety at Work etc Act 1974, Management of Health and Safety at Work Regulations 1992 (HASWA) (as amended 1999), Control of Substances Hazardous to Health Regulations 2002(COSSH), Food and Environment Protection Act 1985 (FEPA), Control of Pesticides Regulations 1986, Provision and Use of Work Equipment Regulations 1998 (PUWER)

Unit 242 Maintain Winter and Summer Sports Turf Surfaces

Outcome 3 Understand the requirements for specific sports surfaces

Assessment Criteria

The learner can:

1. State the **objectives** of the range of activities used to prepare and maintain winter and summer sports surfaces
2. Explain how the **type of machine** and frequency of use affects the turf surface
3. Identify Performance Quality Standards that are **appropriate to specific surfaces**
4. Explain the **benefits** of monitoring the quality of turf surfaces

Unit content

Objectives

Improve presentational quality, improve structure, improve stability, increase carrying capacity, improve specific playing qualities

Types of machine

Types of machine (pedestrian, ride-on and tractor mounted) and mode of action (powered hand held, non-powered)

Appropriate to specific surfaces

Levels of Performance Quality Standards: basic (recreational use), standard (general club use) and high (professional and international use)
Structural: determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate
Presentational: e.g. appearance, visibility of and width of markings, posts, surface debris, and sward colour
Playing: e.g. vertical ball bounce, traction, ball roll, spin, hardness

Benefits

Inform management decisions, determine maintenance requirement accurately, justify purchase of equipment/resources, effective use of inputs, reduced wastage, determine the carrying capacity of the turf

Unit 242 Maintain Winter and Summer Sports Turf Surfaces

Outcome 4 Be able to monitor and assess the level of quality of sports surfaces

Assessment Criteria

The learner can:

1. Use at least **16 appropriate Performance Quality Standards** to monitor the level of quality of a turf surface
2. **Interpret** the results of monitoring activities
3. Identify any **remedial action** that may be required

Unit content

16 appropriate Performance Quality Standards

Structural: e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate

Presentational: e.g. appearance, visibility of and width of markings, posts, surface debris, and sward colour

Playing: e.g. vertical ball bounce, traction, ball roll, spin, hardness

Interpret

Interpret results and identify Performance Quality Standards level: basic (recreational use), standard (general club use) and high (professional and international use)

Remedial action

Identification of remedial action to bring the turf surface to the stated level of quality e.g. mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding, marking, rolling, removal of debris

Unit 242 Maintain Winter and Summer Sports Turf Surfaces

Notes for guidance

This unit is designed to provide the learner with the sound knowledge and the skills required to maintain and renovate winter and summer sports surfaces. They should be able to select and safely use appropriate machines, equipment and materials for these tasks. The unit should cover as wide a range of activities as possible, appropriate to the sports turf sites available to the learner.

Throughout the unit, the emphasis should be on safe working. It is expected that the learner may not be aware of basic safe working practices with turf maintenance machinery but is likely to be familiar with accepted practices and behaviours within the context in which they are working. It is a requirement for the learner to operate machinery therefore health and safety issues relevant to the operation of the machinery used must be stressed and regularly reinforced. The learner should be actively involved in comprehensive risk assessments.

Health and safety - Centres and tutors need to be aware of the need to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of machinery is involved. The units in this qualification require the learner to undertake machinery operations under close supervision, and this is the same for any unit within the qualification that requires the learner to operate or use machinery. The first two LOs involve practical activities and the basic use of tools/machinery. Throughout the unit, the emphasis should be on safe working. The guidance in this unit requires that Health and Safety must be strictly enforced and repeated throughout. The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

All equipment/machinery being used must comply with relevant requirements of the Provision and Use of Work Equipment Regulations (PUWER) 1998. Adequate Personal Protective Equipment (PPE) appropriate to the learner, the machinery and the task must be provided and worn in accordance with the associated risk assessment, industry guidance and operator's manual.

In Outcome 1 the learner will be required to maintain and renovate winter sports surfaces to sustain or improve the level of quality. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner must be able to mark out at least ¼ of an association football pitch, over-mark existing lines on a whole pitch and set out nets and corner flags. The learner must be able to lead and direct any helpers during marking out.

In Outcome 2 the learner will be required to maintain and renovate summer sports surfaces to sustain or improve the level of quality. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner must be able to prepare a summer sports surface for play e.g. setting and marking out for cricket/tennis or cutting holes on golf greens and setting markers on tees. The learner must be able to lead and direct any helpers during marking out.

In Outcome 3 the learner will understand the requirements for specific sports surfaces. The learner should determine the range of activities commonly carried out, why they are important and how they impact upon the performance quality standards appropriate to 2 different sports surfaces.

In Outcome 4 the learner will be required to monitor and assess the level of quality of sports surfaces. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The learner should identify

at least eight appropriate structural quality, two presentational quality and two playing quality, and a total of sixteen performance quality standards that are appropriate to two specific sports surfaces.

A learner working towards level 2 is likely to have some experience of practical sports turf activities. This unit aims to develop the learner's knowledge and skills involved with the safe use of sports turf machinery and equipment. Emphasis should be placed upon 'doing' and developing practical experience. The learner should be given appropriate time to develop their skills. It is important that the learner understands the importance of maintaining an awareness of current legislation and Codes of Practice in relation to turf maintenance and renovation operations.

Learners should have appropriate access to suitable sports facilities for practical lessons and assessment. Where resources at the centre are limited, visits to sports grounds would be useful to complement lessons at the centre. However, the learners should have regular access for practical work on sports grounds over at least one full season in order to develop their skills to the required level.

References

Books

Adams WA and Gibbs RJ. 1994. *Natural Turf for Sport and Amenity: Science and Practice*. CAB International. ISBN: 0-851-98720-6.

Brown S. 2005. *Sports Turf and Amenity Grassland Management.* The Crowood Press.
ISBN: 1-861-26790-8.

Evans RDC. 1991. *Cricket Grounds: The Evolution, Maintenance and Construction of Natural Turf Cricket Tables and Outfields.* The Sports Turf Research Institute. ISBN: 1-873-43100-7.

Evans RDC. 1994. *Winter Games Pitches: The Construction and Maintenance of Natural Turf Pitches.* The Sports Turf Research Institute. ISBN: 1-873-43103-1.

Brown S. 2009. *Sports Ground Management: A Complete Guide*. The Crowood Press. ISBN: 1-847-97094-X.

Perris J. 2000. *Grass Tennis Courts: How to Construct and Maintain Them.* The Sports Turf Research Institute. ISBN: 1-873-43134-1.

Perris J. 2008. *All About Bowls: The History, Construction and Maintenance of Bowling*. The Sports Turf Research Institute. ISBN: 1-873-43106-6.

Perris J and Evans RDC. 1996. *The Care of the Golf Course*. The Sports Turf Research Institute. ISBN: 1-873-43119-8.

Sachs P. 2004. *Managing Healthy Sports Fields.* Wiley. ISBN: 0-471-47269-7.

Sports Turf Research Institute. 2005. *STRI Guidelines to Golf Green Construction in the United Kingdom*. Yorkshire: The Sports Turf Research Institute. ISBN: 1-873-43159-7.

Turgeon AJ. 2005. *Turfgrass Management.* Prentice Hall. ISBN: 0-131-14000-0.

Websites

www.iog.org The Institute of Groundsmanship

Unit 243 Understand the Principles of Sports and Amenity Turf Maintenance

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of sports and amenity maintenance. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop knowledge of sports and amenity turf maintenance and renovation activities and the use of Performance Quality Standards in the development of surfaces for specific purposes.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Understand the effects of sports and amenity turf maintenance activities
2. Understand the irrigation and nutrition of sports and amenity turf
3. Understand sports and amenity turf renovation activities
4. Understand the use of Performance Quality Standards

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

L5 Maintain the health of sports turf

L6 Present, maintain and repair sports turf surfaces for play

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC and the Institute of Groundsmanship.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 243 Understand the Principles of Sports and Amenity Turf Maintenance

Outcome 1 Understand the effects of sports and amenity turf maintenance activities

Assessment Criteria

The learner can:

1. Explain the effects of the range of **turf maintenance activities** on the development of the sward
   - seasonal factors
   - weather
   - soil conditions
2. Explain how different **settings and frequencies** of use affect the growth and density of the sward
3. Describe the use of specific equipment in the **preparation of turf surfaces**

Unit content

Turf maintenance activities

Objectives, the effects of seasonal factors, the uses of different attachments and settings must be covered for the following activities: mowing, scarification, aeration/verti-draining, verti-cutting, top-dressing, rolling, over-seeding, brushing/drag matting, switching

Settings and frequencies

Types of mowers for specific surfaces, frequency of use and heights of cut, mowing stress, 'never mow off more than 1/3 of the blade' rule

Compare mowing settings and frequencies for golf/bowling green with a rugby pitch, benefits and limitations of removal of grass clippings, turf groomer

Preparation of turf surfaces

When preparing sports turf it is the quality of the playing surface that is of primary concern. This varies with the need of the sport. For example, in cricket and tennis a hard surface is needed so that the ball bounces. For safety the surface needs to be even too. These surfaces are top-dressed with a high clay top-soil, so that they can be rolled in spring to form a hard surface. The blades of the grass are mown off on a cricket pitch and it is the roots that hold the pitch together during play. During the season different pitches are brought in and out of play. For golf greens and bowling greens ball roll/green speed are important factors. Very fine grasses are used which thrive on an acid soil, so the rootzone and top-dressing have a high sand content. A very even surface and a low height of cut are needed. To offset the stress this causes, frequent mowing, grooming, feeding and irrigation are required when the grass is growing. In football ball bounce, ball traction and ball roll are important.

Unit 243 Understand the Principles of Sports and Amenity Turf Maintenance

Outcome 2 Understand the irrigation and nutrition of sports and amenity turf

Assessment Criteria

The learner can:

1. Describe portable and permanent **irrigation systems** for turf and the reasons for their use
2. Describe why **fertilisers** are applied to different turf surfaces:
   a. benefits
   b. limitations
3. Compare irrigation and fertiliser use with **natural and artificial rootzones**.

Unit content

Irrigation systems

Pop-up sprinklers, impact sprinklers, sub-irrigation systems, portable systems, benefits and limitations of each, frequency and timing of application, application rate, methods of calculation of water requirement, sources of water

Fertilisers

Benefits/limitations of organic/inorganic fertilisers, formulations of fertilisers, e.g. straight, mixture and compound, solid and liquid, controlled release, mini-granules/prills, nutrient requirement of turf surfaces, fertilisers of different nutrient values and their times of use

Natural and artificial rootzones

Fertiliser and irrigation need is linked to the mineral particles in the rootzone. Clay holds onto water and nutrients so water and fertiliser can be applied in larger doses, but less frequently. Sand drains rapidly and nutrients leach out, so fertiliser and water need to be given little and often. High sand content (70-90%), artificial rootzones need the little and often approach to keep the grass growing at a consistent rate

Unit 243 Understand the Principles of Sports and Amenity Turf Maintenance

Outcome 3 Understand sports and amenity turf renovation activities

Assessment Criteria

The learner can:

1. Describe a range of **renovation activities** to meet the needs of specific sports and amenity turf uses
2. Identify turf and weed **grasses** by vegetative characteristics as appropriate to species

Unit content

Renovation activities

Renovation of the following should be covered cricket grounds, tennis courts, association football pitches, rugby pitches, bowling greens, golf courses

Preparation of area and renovation activities (to include mowing, aeration/scarification, divotting, top-dressing, brushing, over-seeding), timing of operations

The timing of renovation usually matches the off-season for the sport, i.e. association football pitches/rugby union are renovated during the summer months May-August rugby league and bowls, tennis and cricket are renovated in the autumn so that the grass recovers straight after the season. Early spring activities are carried out to bring these surfaces to the playing quality required. Golf is unique in that is it played on all year, strategies to deal with this should be covered.

Grasses

Identify the following from seeds: Perennial ryegrass *(Lolium perenne)*, Smooth-stalked meadow grass (*Poa pratensis)*, Chewings, Slender or Strong Red Fescue (*Festuca rubra)*, Browntop bent (*Agrostis spp)*

Identify the following from vegetative characteristics: Perennial ryegrass *(Lolium perenne)*, Smooth-stalked meadow grass *(Poa pratensis)*, Chewings Fescue *Festuca rubra commutata*, Slender or Strong Red Fescue (*Festuca rubra spp)*, Browntop bent*, Agrostis tenuis*, Creeping bent *(Agrostis stolonifera)*, Annual meadow grass *(Poa annua),* Yorkshire fog H*olcus lanata*)

Appropriate growing conditions, mowing height of cut and use of each of the grasses above, how weed grasses maybe controlled

Unit 243 Understand the Principles of Sports and Amenity Turf Maintenance

Outcome 4 Understand the use of Performance Quality Standards

Assessment Criteria

The learner can:

1. Explain the benefits and limitations of **Performance Quality Standards**
2. Select appropriate standards for specific turf uses
3. Describe the relevance of **sustainability** for a natural turf surface

Unit content

Performance Quality Standard

This is a series of objective measurements that can be used to determine the level of quality of a sports surface.

Levels of Performance Quality Standards (basic, standard and high)

Structural: determines playing quality and impacts on presentational quality e.g. total ground cover, bare areas, desirable grass species, length of herbage, weeds, moss, algae and lichen, root depth, thatch, rootzone medium, evenness, gradient, pests, diseases, infiltration rate

Presentational: e.g. appearance, visibility of and width of markings, surface debris, and sward colour

Playing: e.g. vertical ball bounce, traction, ball roll, spin, hardness

Sustainability

Sports surfaces are subject to wear. The more games are played on the surface the more wear takes place until a point is reached at which the surface has deteriorated to an unacceptable level. The job of the groundsman/person or greenkeeper is to help the grass to recover and re-grow as quickly and sturdily as possible. The carrying capacity is the number of games that can take place on a surface without undue deterioration. This will depend on the type of surface, the rootzone, the weather and the intensity of maintenance activities and inputs in terms of fertiliser, water, top-dressing, over-seeding. The principle of sustainability is to balance inputs, resource consumption and carrying capacity with surface quality and user satisfaction. All activities should be undertaken to achieve effective and efficient outcomes, emphasising the conservation of resources and waste minimisation

Unit 243 Understand the Principles of Sports and Amenity Turf Maintenance

Notes for guidance

This unit is designed to provide the learner with the sound knowledge of sports and amenity turf maintenance. The learner is not required to use machinery whilst undertaking this unit.

In Outcome 1 the learner will understand the effects of sports and amenity turf maintenance activities. It is anticipated that the delivery of this outcome will be delivered in association with supervised practical training and the learner able to consolidate operational skills within realistic working environments.

In Outcome 2 the learner will be required to understand the irrigation and nutrition of sports and amenity turf. It is anticipated that the delivery of this outcome will be delivered in association with supervised practical training and the learner able to consolidate operational skills within realistic working environments.

In Outcome 3 the learner will understand sports and amenity turf renovation activities. It is anticipated that the delivery of this outcome will be delivered in association with supervised practical training and the learner able to consolidate operational skills within realistic working environments.

In Outcome 4 the learner will understand the use of Performance Quality Standards. It is anticipated that the delivery of this outcome will be delivered in association with supervised practical training and the learner able to consolidate operational skills within realistic working environments.

A learner working towards level 2 is likely to have some experience of practical sports turf activities. Although this is a theory unit, there should, if possible, be some aspects of 'doing' and developing practical experience. The learner should be given appropriate time to develop their knowledge. It is important that the learner understands the importance of maintaining an awareness of current legislation and Codes of Practice in relation to turf maintenance and renovation operations.

References

Books

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Websites

www.iog.org	The Institute of Groundsmanship

Unit 244 Maintain and Renovate Artificial Sports Surfaces

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of the maintenance and renovation of artificial sports surfaces and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The aim of this unit is to provide the learner with the ability to demonstrate the knowledge and skills required to maintain and renovate artificial/synthetic playing surfaces to ensure they are safe and meet the required standards for the sport.

Learning outcomes

There are **six** learning outcomes to this unit. The learner will:

1. Be able to select, use and maintain equipment
2. Be able to maintain and renovate the condition of artificial sports surfaces
3. Be able to work safely and minimise environmental damage
4. Know the maintenance and renovation requirements of artificial sports surfaces
5. Know the types of equipment required and how to maintain them
6. Know the current health and safety legislation and environmental good practice

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

L7 Present, maintain and repair artificial playing surfaces for play

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 244 Maintain and Renovate Artificial Sports Surfaces

Outcome 1 Be able to select, use and maintain equipment

Assessment Criteria

The learner can:

1. Select **appropriate equipment** for this area of work
2. **Use equipment** according to manufacturer's instructions and legal requirements
3. **Prepare, maintain and store equipment** in a safe and effective working condition

Unit content

Appropriate equipment

In line with manufacturer's instructions for the specific surface, where available

Use equipment

The learner must use the equipment safely and efficiently, in line with manufacturer's instructions for the equipment/surface, and in line with legal requirements

Prepare, maintain and store equipment

According to manufacturers' instructions and organisational policy

Unit 244 Maintain and Renovate Artificial Sports Surfaces

Outcome 2 Be able to maintain and renovate the condition of artificial sports surfaces

Assessment Criteria

The learner can:

1. **Clear and prepare** the surface for maintenance
2. Carry out **operations** to maintain the quality and appearance of the surface suitable for the sport
3. Identify and report any conditions that affect the playing quality of one type of surface

Unit content

Clear and prepare

In line with manufacturers' instructions, where this is available

Four operations

Brushing, luting, top-dressing, weed control, moss/algae control, frost protection, marking out, irrigation, renovation (damage repair), contamination removal

Unit 244 Maintain and Renovate Artificial Sports Surfaces

Outcome 3 Be able to work safely and minimise environmental damage

Assessment Criteria

The learner can:

1. Work in a way which **maintains health and safety** and is consistent with current legislation, codes of practice and any additional requirements
2. Carry out work in a manner which minimises **environmental damage**
3. Dispose of **waste** safely and correctly.

Unit content

Maintains health and safety

The learner must comply with all health and safety legislation during activities

Environmental damage

Within the sports area and the wider environment

Waste

Hazardous and non-hazardous: waste to be disposed of appropriately

Unit 244 Maintain and Renovate Artificial Sports Surfaces

Outcome 4 Know the maintenance and renovation requirements of artificial sports surfaces

Assessment Criteria

The learner can:

1. Describe different methods of maintenance for **surfaces**
2. Describe how **surface and weather conditions** affect maintenance and renovation operations
3. Describe how to prepare **the surface** before carrying out maintenance and renovation operations
4. Describe **methods and techniques** used to maintain and renovate surfaces and perimeters
5. State **the standard of playing quality and appearance** that has to be achieved for the sport

Unit content

Surfaces

Hard porous water bound, filled synthetic, non-filed synthetic

Surface and weather conditions

Effects on each surface listed above

The surface

Each surface listed above

Methods and techniques

Brushing, luting, top-dressing, weed control, moss/algae control, frost protection, marking out, irrigation, renovation (damage repair), contamination removal

The standard of playing quality and appearance

Three sports: one sport for each of the types of surface above

Unit 244 Maintain and Renovate Artificial Sports Surfaces

Outcome 5 Know the types of equipment required and how to maintain them

Assessment Criteria

The learner can:

1. Describe the **equipment** which will be necessary for maintaining and renovating artificial sports surfaces
2. Describe methods of **maintaining the equipment** ready for use.

Unit content

Equipment and maintaining the equipment

The equipment required for each surface listed in outcome 4

Unit 244 Maintain and Renovate Artificial Sports Surfaces

Outcome 6 Know the current health and safety legislation and environmental good practice

Assessment Criteria

The learner can:

1. Outline the current health and safety **legislation, codes of practice** and any additional requirements which apply to this area of work
2. Describe how environmental damage can be minimised
3. Describe the correct methods for disposing of **organic and inorganic waste**.

Unit content

Legislation

Health and Safety at Work etc Act 1974, Management of Health and Safety at Work Regulations 1992 (as amended 1999), Control of Substances Hazardous to Health Regulations 2002, Food and Environment Protection Act 1985, Control of Pesticides Regulations 1986, Provision and Use of Work Equipment Regulations 1998

Codes of practice

Risk assessment, Reporting of Injuries, Diseases and Dangerous Occurrences (RIDDOR) 1995, Green Code: Code of Practice for the Safe Use of Pesticides on Farms and Holdings

Organic and inorganic waste

May include weeds, faeces, glass, plastic, metal cans, paper, chewing gum

Unit 244 Maintain and Renovate Artificial Sports Surfaces

Notes for guidance

The aim of this unit is to provide the learner with the ability to demonstrate the knowledge and skills required to maintain and renovate artificial/synthetic playing surfaces to ensure they are safe and meet the required standards for the sport.

Outcomes 1, 2 and 3 set out the practical skills that must be acquired by the learner. They should be assessed in the context of one type of artificial surface, which the learner needs frequent access to, in order to develop the required level of skill. To pass the assessment, the learner must carry out a minimum of four of the operations listed in outcome 2, but a higher grade is possible if more operations are carried out. More than one type of turf may be included if this will allow the learner to achieve a higher grade.

Outcomes 4, 5 and 6 set out the knowledge required by the learner and cover 3 different types of artificial surface and all types of maintenance carried out on artificial surfaces. Where centres have limited direct access to artificial surfaces, visits to other sports centres offering a variety of surface will be beneficial. Learners will also need access to the Internet, manufacturers' literature and other sources of information in order to carry out the research required.

References

Books

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Brown S. 2009. *Sports Ground Management: A Complete Guide*. The Crowood Press. ISBN: 1-847-97094-X.

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Websites

www.iog.org	The Institute of Groundsmanship

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www.cityandguilds.com

Appendix 1 Relationships to other qualifications

Literacy, language, numeracy and ICT skills development

These qualifications include opportunities to develop and practise many of the skills and techniques required for success in the following qualifications:

- Functional Skills (England) – see **www.cityandguilds.com/functionalskills**
- Essential Skills (Northern Ireland) – see **www.cityandguilds.com/essentialskillsni**
- Essential Skills Wales – see **www.cityandguilds.com/esw**

There might also be opportunities to develop skills and/or portfolio evidence if learners are completing any Key Skills alongside these qualifications.

Appendix 2 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on **www.cityandguilds.com**.

Providing City & Guilds qualifications – a guide to centre and qualification approval contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification. Specifically, the document includes sections on:

- The centre and qualification approval process and forms
- Assessment, verification and examination roles at the centre
- Registration and certification of learners
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Frequently asked questions.

Ensuring quality contains updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document contains information on:

- Management systems
- Maintaining records
- Assessment
- Internal verification and quality assurance
- External verification.

Access to Assessment & Qualifications provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for learners who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information such as:

- ***Walled Garden***
  Find out how to register and certificate learners on line
- ***Events***
  Contains dates and information on the latest Centre events

Useful contacts

Type	Contact	Query
UK learners	T: +44 (0)84 4543 0033 E: learnersupport@cityandguilds.com	• General qualification information
Centres	T: +44 (0)84 4543 0000 F: +44 (0)20 7294 2413 E: centresupport@cityandguilds.com	• Exam entries • Registrations/enrolment • Certificates • Invoices • Missing or late exam materials • Nominal roll reports • Results
Walled Garden	T: +44 (0)84 4543 0000 F: +44 (0)20 7294 2405 E: walledgarden@cityandguilds.com	• Re-issue of password or username • Technical problems • Entries • Results • GOLA • Navigation • User/menu option problems
Employer	T: +44 (0)121 503 8993 E: business_unit@cityandguilds.com	• Employer solutions • Mapping • Accreditation • Development Skills • Consultancy

If you have a complaint, or any suggestions for improvement about any of the services that City & Guilds provides, email: **feedbackandcomplaints@cityandguilds.com**

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