Edexcel BTEC Levels 4 and 5 Higher Nationals units in Animal Management

Contents

Unit 1: Business Environment

Unit code: Y/601/0546

Level: 4

Credit value: 15

Aim

The aim of this unit is to provide learners with an understanding of different organisations, the influence of stakeholders and the relationship between businesses and the local, national and global environments.

Unit abstract

This unit allows learners to research the purpose and nature of business organisations and how these operate in ways that allow business objectives to be met. They will investigate the links with business stakeholders.

Businesses operate in an environment shaped by the government, competitors, consumers, suppliers and international factors. Learners will develop their understanding of direct influences on businesses in this environment, for example taxation policies on corporate activities. They will also consider other influences are less clear, such as those from the international arena and those with only an oblique impact on the national business environment.

Learners will explore business markets and how the form and structure of a market influences how organisations behave. Learners will consider how different market structures may shape the pricing and output decisions of businesses, as well as other aspects of their behaviour.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the organisational purposes of businesses

2 Understand the nature of the national environment in which businesses operate

3 Understand the behaviour of organisations in their market environment

4 Be able to assess the significance of global factors that shape national business activities.

Unit content

1 **Understand the organisational purposes of businesses**

Categories of organisation: type eg private company, public company, Government, voluntary organisation, co-operative, charitable; sector (primary, secondary, tertiary)

Purposes: mission; vision; aims; objectives; goals; values; profits; market share; growth; return on capital employed (ROCE); sales; service level; customer satisfaction; corporate responsibility; ethical issues

Stakeholder expectations: owners; customers; suppliers; employees; debtors; creditors; financial institutions (banks, mortgage lenders, credit factors); environmental groups; government agencies (central government, local authorities); trade unions

Responsibilities of organisations: stakeholder interests; conflict of expectations; power, influence matrix; satisfying stakeholder objectives; legal responsibilities eg consumer legislation, employee legislation, equal opportunities and anti-discriminatory legislation, environmental legislation, health and safety legislation; ethical issues eg environment, fair trade, global warming, charter compliance eg Banking Code

2 **Understand the nature of the national environment in which businesses operate**

Economic systems: the allocation of scarce resources; effective use of resources; type of economic system eg command, free enterprise, mixed, transitional

The UK economy: size (gross domestic product, gross national product); structure; population; labour force; growth; inflation; balance of payments; balance of trade; exchange rates; trading partners; public finances (revenues, expenditure); taxation; government borrowing; business behaviour eg investment, objectives, risk awareness; cost of capital; consumer behaviour; propensity to save; propensity to spend; tastes and preferences

Government policy: economic goals; fiscal policy: control of aggregate demand; central and local government spending; Public Sector Net Borrowing (PSNB) and Public Sector Net Cash Requirement (PSNCR); euro convergence criteria, monetary policy; interest rates; quantitative easing; private finance initiative (PFI); competition policy (up-to-date legislation including Competition Act 1998, Enterprise Act 2002); Competition Commission, Office of Fair Trading; Directorate General for Competition); European Commission); sector regulators eg Ofgem, Ofwat, Civil Aviation Authority; Companies Acts; regional policy; industrial policy; enterprise strategy; training and skills policy

3 **Understand the behaviour of organisations in their market environment**

Market types: perfect competition, monopoly, monopolistic competition, oligopoly, duopoly; competitive advantage; strategies adopted by firms; regulation of competition

Market forces and organisational responses: supply and demand, elasticity of demand; elasticity of supply; customer perceptions and actions, pricing decisions; cost and output decisions; economies of scale; the short run; the long run; multi-national an transnational corporations; joint ventures; outsourcing; core markets; labour market trends; employee skills; technology; innovation; research and development; core competencies

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Business and cultural environments: business environment evaluation (political, economic, social, technical, legal, environmental); cultural environment, cultural web; wider issues relevant to organisations eg biodiversity, health and social inclusion, ethical considerations, sustainability, social equality and diversity

4 **Be able to assess the significance of global factors that shape national business activities**

Global factors: international trade and the UK economy; market opportunities; global growth; protectionism; World Trade Organisation (WTO); emerging markets (BRIC economies – Brazil, Russia, India, China)

Impact on UK Organisations: business; competition; growth; employment; education; economics and finance; employment; environment; science and technology; regional; labour movement; workforce skills; exchange rates; trading blocs eg monetary unions, common markets; customs unions; free trade areas; labour costs; trade duties; levies; tariffs; customs dues; taxation regimes; international competitiveness; international business environment (political, economic, social, technical, legal, environmental); investment incentives; cost of capital; commodity prices; intellectual property; climate change eg Kyoto Protocol, Rio Earth Summit; third world poverty; the group of 20 (G-20); global financial stability

EU policies: EU membership; EU business regulations and their incorporation in to UK law; EU policies eg agriculture

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the organisational purposes of businesses	1.1 identify the purposes of different types of organisation 1.2 describe the extent to which an organisation meets the objectives of different stakeholders 1.3 explain the responsibilities of an organisation and strategies employed to meet them
LO2. Understand the nature of the national environment in which businesses operate	2.1 explain how economic systems attempt to allocate resources effectively 2.2 assess the impact of fiscal and monetary policy on business organisations and their activities 2.3 evaluate the impact of competition policy and other regulatory mechanisms on the activities of a selected organisation
LO3 Understand the behaviour of organisations in their market environment	3.1 explain how market structures determine the pricing and output decisions of businesses 3.2 illustrate the way in which market forces shape organisational responses using a range of examples 3.3 judge how the business and cultural environments shape the behaviour of a selected organisation
LO4 Be able to assess the significance of global factors that shape national business activities	4.1 discuss the significance of international trade to UK business organisations 4.2 analyse the impact of global factors on UK business organisations 4.3 evaluate the impact of policies of the European Union on UK business organisations

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Guidance

Links

This unit provides an opportunity for learners to explore the business environment within the UK and understand International factors influencing organisations.

Essential requirements

Learners must keep up to date with current issues that may influence business behaviour within the Land-based sector. They must be encouraged to engage in regular research through a variety of sources eg reading quality newspapers and trade journals, watching news and current affairs programmes on the television. Attention should be paid to international trade and global factors that have an impact on UK businesses.

Sufficient time must be built into the teaching schedule to allow learners to undertake research into current issues.

Employer engagement and vocational contexts

Centres can develop links with local employers. Many businesses look to employ learners when they finish their programmes of study and may provide information about the business environment which they operate in. They will have a view about the impact of the governmental and EU factors that shape how they behave. Guest speakers can offer an insight into such factors.

Many learners are, or have been, employed and will be able to draw on their experience of employment. They will have had experience of the nature of the business environment and the ways in which organisations respond to and determine future responsive strategies.

Unit 2: Animal Husbandry Management

Unit code: K/503/1620

Level: 5

Credit value: 15

Aim

This unit aims to develop learners' skills in the practical management of animals to give them the opportunity to apply practical competence in the direct handling and management of animals and to understand the relationship between husbandry and disease prevention in a range of routine and non-routine situations.

Unit abstract

This unit promotes the keeping of animals in environments which promote their mental and physical health, giving learners an insight into the legislation relevant to, and management records needed to, manage animals effectively. Learners will also develop an understanding of the relationship between good animal husbandry, disease prevention and health.

Learners will research practical animal management techniques to develop their skill and confidence in supervising the management of a wide range of animal species. They will develop confidence in handling and all tasks related to the animal husbandry, their health and accommodation.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the importance of good animal husbandry practice

2 Be able to use appropriate animal management techniques

3 Understand how to manage animal accommodation

4 Be able to manage the administrative requirements of animal husbandry.

Unit content

1 **Understand the importance of good animal husbandry practice**

Signs of health: monitoring and recording; recognition and interpretation of physiological and behavioural indicators; diagnostic techniques (invasive and non-invasive)

Principles of good husbandry practice: relationship between environment and health status; disinfection and sterilisation; isolation and barrier nursing techniques; import and export health certification; quarantine systems and alternatives; five needs; duties of care; effects of diet on animal health; prophylactic treatments and veterinary care; safe storage; handling; administration and disposal of medicants; reasons for and methods of euthanasia; disposal of cadavers and clinical waste; relevant legislation eg Control Of Substances Hazardous to Health Regulations (COSHH), Health and Safety at Work Act and other legislation in relation to routine healthcare

2 **Be able to use appropriate animal management techniques**

Animal handling: consideration of animal behaviour; physiological state; approach methods; toxic and/or dangerous species; selection of handling technique; correct capture and restraint methods in a range of situations; use of PPE and handling equipment; preparation of animals for transit in line with legislative and welfare guidelines; movement of animals

Animal husbandry: assessment of physical and mental condition; appreciation of species; breed and individual characteristics; grooming and preventative healthcare; routine healthcare and stock tasks; provision of appropriate exercise opportunities; dietary formulation and preparation; food assessment; storage and disposal; consideration of species' feeding behaviour; feeding regimes

3 **Understand how to manage animal accommodation**

Accommodation requirements: consideration of function; five needs; species specificity; siting; space; materials; ventilation; drainage; temperature; hygiene; safety; security; substrate/bedding; furnishings; enrichment; legislation

Provision of accommodation: design; preparation; maintenance and appraisal of animal accommodation appropriate to the industry (eg aquaria, vivaria, aviaries, cages, kennels, cat pens, stables, paddocks, fields and other large animal accommodation)

Prepare and maintain suitable accommodation: livestock management during maintenance**;** daily, weekly and periodic cleaning and maintenance tasks; cleaning regime; use of PPE; safe use of appropriate cleaning chemicals; health and safety; environmental impact

4 **Be able to manage the administrative requirements of animal husbandry**

Data management: importance of animal management record keeping; identification of required data; observation and recording of animal welfare data; information storage and retrieval (manual and computerised); analysis and utilisation of data; information networks; stock identification; legislative requirements for record keeping

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the importance of good animal husbandry practice	1.1 examine factors relevant to safe and effective animal handling and management 1.2 critically evaluate the assessment of animal health/ill health 1.3 examine animal health monitoring and recording 1.4 compare the range of available animal diagnostic techniques 1.5 evaluate dietary formulation and provision for a range of animal physiological requirements
LO2 Be able to use appropriate animal management techniques	2.1 carry out appropriately selected animal handling and restraint techniques 2.2 correctly assess animals' physical and mental conditions 2.3 carry out dietary management to suit a range of physiological requirements
LO3 Understand how to manage animal accommodation	3.1 critically evaluate the provision of animal accommodation for a variety of circumstances and settings 3.2 recommend appropriate improvements to the provision of animal accommodation
LO4 Be able to manage the administrative requirements of animal husbandry	4.1 manage animal observation, recording and welfare assessment 4.2 analyse information in the routine management of animals 4.3 explain the importance of record keeping related to given animals 4.4 outline the legislative requirements relevant to record keeping for given animals

Guidance

Links

The learning outcomes in this unit are closely linked to *Unit 3: Animal Health and Welfare* and *Unit 16: Management of Animal Collections*.

Essential requirements

To support them in achieving in this unit, learners must be given the opportunity to manage animals on a regular basis. A wide range of health and husbandry-related tasks, at a supervisory level, must be provided for learners to develop competence and confidence. The centre should provide all physical resources needed to enable regular access to a range of animals or make alternative arrangements to give learners this access.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit.

Learners should have access to relevant books, journals and periodicals relating to animal husbandry and management to develop academic, vocational and independent study skills.

Employer engagement and vocational contexts

A team of employers could be identified to help to support the different units in the qualification. Employers could help tutors in developing the programme of learning, provide guest speakers or in design assessment activities.

Delivery of this unit would be enhanced by learner visits to a variety of animal collections to view a wide range of animal accommodation and study animal husbandry techniques in a range of different settings. Sustained links with animal collections could support further units as well as work placements

Guest speakers from a variety of sectors, zoos, farm parks, sea life centres etc, would add value to this unit in enabling learners to discuss differing techniques related to animal health and husbandry.

Unit 3: Animal Health and Welfare

Unit code: D/503/1565

Level: 5

Credit value: 15

Aim

This unit aims to develop learner understanding of animal health and welfare. Learners will explore the factors which can affect the health of animals, the causal agents of animal disease and disease transmission and the measures which can be adopted to minimise the risks of disease and/or injury.

Unit abstract

With an increasing emphasis on animal welfare and health, it is important that learners develop the ability to analyse the clear link between how animals are kept and maintained and the effects this may have on their health. This unit explores common animal diseases, and gives learners the opportunity to research and evaluate the effects, causal agents and aetiology of these diseases. Learners will investigate the importance of reviewing animal welfare conditions and how this impacts on animal health.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the effect of husbandry on animal health

2 Understand causative agents and routes of transmission for disease

3 Understand methods for the control and prevention of common diseases

4 Be able to assess welfare conditions for animals.

Unit content

1 **Understand the effect of husbandry on animal health**

Husbandry: feeding correct type, quality and quantity of food; cleaning and disinfection routines; providing exercise and enrichment; minimisation of stress; social interaction with other animals; provision of prophylaxis and preventative care; staff training; codes of practice for the animals and husbandry routines

Health and disease: examples of common animal diseases and ill heath (definition, identification, treatment, prevention) eg worms; clinical terminology used; significance of health in relation to animal management; production; economics; current relevant legislation eg Animal Welfare Act, Zoo Animals Act, Animal Health Act, Public Health (control of disease) Act; practitioners' roles and responsibilities; zoonoses; notifiable diseases

Health monitoring: invasive and non-invasive techniques for monitoring; observation and frequency of monitoring; signs of health-normal and abnormal for species; information source; stock knowledge; health recording; diagnostic techniques

2 **Understand causative agents and routes of transmission for disease**

Causative agents: micro-organisms; bacteria; fungi; viruses; spread; structure and replication

Helminths and protozoa: cestodes; nematodes; trematodes; structure; life cycle; symptoms

Ectoparasites: insects; lice; fleas; dipteran flies; arachnids; mites; ticks; importance of veterinary work

Routes of transmission: direct; indirect; horizontal; vertical; sites of entry; sites of exit

3 **Understand methods for the control and prevention of common diseases**

Hygiene and housing in disease control and prevention: use of chemical disinfectants and antiseptics; effectiveness; environmental awareness; pollution control; isolation and quarantine; disease prevalence of area and animal unit

Vaccination: live vaccines; attenuated; killed; effectiveness; current vaccines; adjuvants; passive immunity

Chemotherapy: selective toxicity; spectrum of activity; adverse reactions; drug metabolism; administration; modes of action; drug resistance and toxicitiy

4 **Be able to assess welfare conditions for animals**

Animal welfare assessment: factors affecting welfare; limitations of assessment practices; invasive and non-invasive techniques and effects on results; controlled environment experiments; range of viewpoints; public perception; producer and consumer conflicts

Environmental appraisal: environmental conditions; specific purpose and keeping requirements/restraints for different groups of animals; public health and safety; economics; accommodation and agriculture appraisal; potential improvements; behavioural and environmental enrichment

Regulation and related organisations: relevant UK, international and European welfare legislation; codes of practice and conduct; related guidelines, legal enforcement procedures and penalties eg animal passports, horse passports; relevant governmental and non-governmental animal health and welfare organisations

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the effect of husbandry on animal health	1.1 evaluate the factors that contribute to good husbandry practice 1.2 explain techniques available for monitoring the health of livestock 1.3 assess the suitability of animal husbandry techniques in relation to animal health
LO2 Understand causative agents and routes of transmission for disease	2.1 explain the structure and replication of bacteria, viruses and fungi 2.2 assess the importance of helminth and protozoa life cycles to veterinary practice 2.3 examine the veterinary importance of ectoparasites 2.4 explain the importance of different routes of disease transmission
LO3 Understand methods for the control and prevention of common diseases	3.1 evaluate the disease potential of a named animal facility 3.2 recommend valid measures that could be taken to prevent disease transmission 3.3 explain the role of vaccination and chemotherapy in disease prevention
LO4 Be able to assess welfare conditions for animals	4.1 undertake a valid animal welfare assessment for given animal units 4.2 undertake a valid environmental appraisal for given animal units 4.3 recommend animal enrichment improvements for given animal units 4.4 review animal welfare regulations relevant to given animals

Guidance

Links

This unit introduces learners to animal health and welfare and links to the following units:

Unit 2: Animal Husbandry Management

Unit 15: Principles of Animal Health

Unit 18: Animal Nursing.

Essential requirements

Learners need to assess the condition of a minimum of two animal units, such as kennels, stud yards, veterinary facilities and/or research facilities. Learners must have access to the internet as well as to up-to-date literature on animal health and welfare. Laboratory equipment should be made available for learners to analyse animal health, for example access to equipment to carry out faecal egg counts and parasite analysis. Microscopes are essential items of equipment for this unit.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit.

Employer engagement and vocational contexts

Delivery of this unit would be enhanced by the visits from relevant experts such as veterinary professionals and/or personnel from agencies such as Defra and environmental health departments. Learners would benefit from off-site visits to, for example, the Veterinary Laboratories agency (VLA), as well as animal rescue centres, boarding establishments and/or animal testing laboratories to evaluate different types of husbandry and welfare of animals kept in controlled situations. Discussion on how learners' own animals are kept could also be a starting point for the evaluation and analysis of animal health and welfare. Vaccinations and potential alternatives could be discussed and personnel from animal medical companies could be a useful source of information.

Learners could also benefit from carrying out practical activities such as analysing faeces for parasite infestations, analysing skin scrapes and hair/fur samples for signs of abnormalities. It may be useful for a veterinary professional, for example a veterinary nurse, to lead these exercises.

Unit 4: Animal Nutrition

Unit code: D/503/1677

Level: 4

Credit value: 15

Aim

The unit aims to develop learner understanding of the nutritional needs of a variety of animal species and factors that are important in designing appropriate feeding regimes. Learners will develop the practical skills needed to determine appropriate animal feeding regimes.

Unit abstract

This unit is concerned with the nutrition of production, collection and companion animals. A sound knowledge of the theoretical, as well as the practical, aspects of nutrition is essential to ensure the health and welfare of animals.

The unit focuses on the physical and chemical properties of dietary constituents and the application of this information to ration formulation. Learners will examine the methods commonly used for the analysis of foodstuffs, and their limitations to the nutritionist, along with dietary calculations for different feedstuffs.

The unit will promote an awareness of the dietary needs of a variety of animal species in a range of circumstances. Learners will investigate factors affecting the nutritional requirements of a range of animals and the effects of not meeting an animal's requirements, in terms of health, welfare and performance.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the chemical composition and roles of macro and micronutrients

2 Understand the principles of animal food analysis

3 Understand the nutritional requirements of animals

4 Understand the role of nutrition in animal health and diet-related diseases.

Unit content

1 **Understand the chemical composition and roles of macro and micronutrients**

Carbohydrates: simple and complex structures; sugars; starches; glycogen, non-starch polysaccharides; sources and functions

Protein: primary, secondary, tertiary and quaternary structure; sources; functions; essential amino acids

Lipids: structures; sources and functions (fats, oils, phospholipids, steroids, triglycerides); saturated, mono- and poly-unsaturated; essential fatty acids

Water: structure, functions, sources

Vitamins: structures, sources and functions; water-soluble, fat-soluble; bioavailability

Minerals: macro-minerals; micro-minerals; structures, sources and functions

2 **Understand the principles of animal food analysis**

Methods: dry matter; proximate analysis (ether extract, ash, crude fibre, nitrogen-free extract), bomb calorimetry; amino acid analysis; atomic absorption spectrophotometry; chromatography; high performance liquid chromatography (HPLC) for mycotoxins; automated analytical equipment

Digestibility: apparent digestibility; true digestibility; digestion trials; species variation

Energy: partitioning; measurement of DE and ME

Dietary calculations and nutritional labelling: dry matter; energy content; protein content

3 **Understand the nutritional requirements of animals**

Factors of and effects on nutritional requirements: condition; age; work; health; species; breed; environmental temperature; gestation and lactation as appropriate

Ration formulation and dietary calculations: feed intake; palatability; requirements for energy; amino acids; minerals; vitamins; dry matter; protein content

4 **Understand the role of nutrition in animal health and diet-related diseases**

Metabolic processes: catabolism; anabolism; energy production; amino acid interconversion

Nutrients: normal balances and reserves

Diet-related disease: presence of common mycotoxins and plant toxins; metabolic disorders; excesses and deficiencies; causes of deficiencies (poor intake, poor bioavailability, presence of antagonistic compounds); common diseases related to nutrition (eg coronary heart disease, kidney disease, obesity, laminitis)

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the chemical composition and roles of macro and micronutrients	1.1 determine the chemical structure of macronutrients 1.2 examine the chemical and physical properties of macronutrients 1.3 justify dietary sources of macro and micronutrients in relation to given animals 1.4 explain the uses and functions of macro and micronutrients in the body
LO2 Understand the principles of animal food analysis	2.1 examine the methods available for food analysis 2.2 evaluate the digestibility of different feeds 2.3 examine the partition of energy in nutrition 2.4 calculate dietary requirements for a variety of animal feeds
LO3 Understand the nutritional requirements of animals	3.1 discuss the factors affecting animal nutrient requirements in a range of production, collection and companion circumstances 3.2 determine the energy requirements for animals in a range of circumstances 3.3 critically assess the formulation of rations for animals in a range of circumstances
LO4 Understand the role of nutrition in animal health and diet-related diseases	4.1 analyse the relationship between diet and animal health 4.2 evaluate factors affecting incidences of diet-related animal diseases

Guidance

Links

This unit links with *Unit 2: Animal Husbandry Management*, *Unit 3: Animal Health and Welfare*, as well as *Unit 7: Biological Principles*, *Unit 10: Anatomy and Physiology*, *Unit 13: Animal Law and Ethics* and *Unit 19: Production Animal Management*.

Essential requirements

Learners will need access to specialist animal nutrition textbooks at level 3 and above and to the internet.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit.

Employer engagement and vocational contexts

Any professional involved in maintaining animal health and welfare will be involved in animal nutrition, which gives learners scope to see the importance of understanding nutrition in a range of fields. This will include the production and manufacturing of animal feed, veterinary surgeons, and all those who own animals for pleasure or those who own animals for commercial purposes such as meat, milk or egg production, or those maintaining animal collections.

Feed manufacturers and retailers are often prepared to provide specialist visiting speakers who may help learners to make the link between the physiological importance of nutrients and the formulation of rations. Learners could work with farmers or collection owners to investigate nutritional requirements of animals in a range of circumstances, taking into account the factors that can affect nutrition, animal health and welfare.

Unit 5: Research Project

Unit code: K/601/0941

Level: 5

Credit value: 20

Aim

This unit aims to develop learners' skills of independent enquiry and critical analysis through undertaking a sustained research investigation of direct relevance to their higher education programme and professional development.

Unit abstract

In this unit learners will conduct an in-depth investigation into an aspect of their programme of study. This research may be developed from elements of the programme linked to the learner's individual interests or to areas where they may wish to seek future employment.

Completion of this unit will enhance learners' understanding of the techniques used in the formulation of research projects, typical research methodologies and formats of presentation. Whether the methodology is experimental, observational and/or involves the collection of data from other sources, it will enable the production of significant primary data and encourage learners to be innovative.

This unit will also develop transferable skills in areas such as planning, data collation and handling, data analysis, working safely and communication skills in aspects such as report writing and data presentation.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand how to formulate a research specification

2 Be able to implement the research project within agreed procedures and to specification

3 Be able to evaluate the research outcomes

4 Be able to present the research outcomes.

Unit content

1 **Understand how to formulate a research specification**

Formulate research specifications: rationale for project selection; aims and objectives; research questions and formulation of hypotheses; limitations

Factors affecting selection: methodology for data collection and analysis; literature review; critique of references from primary sources eg pilot studies, questionnaires, interviews; secondary sources eg books, journals, internet; scope and limitations; implications eg equipment and resources, health and safety considerations in practical work - potential hazards, assessment of risk, procedures for minimisation of risk

Critical review: access to key secondary texts, websites and other information sources

Project specification: suitability; skills and knowledge to be gained; aims and objectives; terms of reference; duration; ethical issues; type of research eg qualitative, quantitative, systematic, original; methodology; resources; statistical analyses; validity; reliability; control of variables; sources of error

Research plan: rationale for research questions or hypotheses; milestones; task dates; review dates; monitoring/reviewing process; strategy

2 **Be able to implement the research project within agreed procedures and to specification**

Implement: according to research design and method; health and safety equipment and procedures; test research hypotheses; consider test validity; reliability

Data collection: selection of appropriate tools for data collection; types eg qualitative, quantitative; systematic recording; methodological problems eg bias, variables and control of variables; required repetitions, if appropriate, to establish reproducibility; reliability and validity; correct use of appropriate units

Data analysis and interpretation: qualitative and quantitative data analysis – interpreting transcripts; coding techniques; specialist software; statistical tables; comparison of variable; trends; forecasting

3 **Be able to evaluate the research outcomes**

Results: establish validity; use of correct statistical techniques; sources of error identified

Evaluation of outcomes: overview of the successes and failings of the research project's processes and findings eg planning, aims and objectives, evidence and findings, validity, reliability, benefits, difficulties, conclusion(s)

Implications for future research: significance of research investigation; application of research results; implications; limitations of the investigation; improvements; recommendations and suggested areas for future research

4 **Be able to present the research outcomes**

Format: professional delivery format appropriate to the audience; use of appropriate media

Written structure: report conforms to appropriate academic format eg includes an abstract introduction, literature review, methodology, results, discussion, conclusion; references in appropriate format

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand how to formulate a research specification	1.1 formulate and record possible research project outline specifications 1.2 identify the factors that contribute to the process of research project selection 1.3 undertake a critical review of key references 1.4 produce a research project specification 1.5 provide an appropriate plan and procedures for the agreed research specification
LO2 Be able to implement the research project within agreed procedures and to specification	2.1 match resources efficiently to the research question or hypothesis 2.2 undertake the proposed research investigation in accordance with the agreed specification and procedures. 2.3 record and collate relevant data where appropriate
LO3 Be able to evaluate the research outcomes	3.1 use appropriate research evaluation techniques 3.2 interpret and analyse the results in terms of the original research specification 3.3 make recommendations and justify areas for further consideration
LO4 Be able to present the research outcomes	4.1 use an agreed format and appropriate media to present the outcomes of the research to an audience

Guidance

Links

This unit offers links with several other units from the programme area depending on the research project carried out and the learner's individual interests. *Unit 39: Research Methods for Land-based Industries* is not an essential pre-requisite for undertaking this core unit, but learners may benefit from having completed this unit first. To further enhance learner employability, linking the research project to *Unit 6: Work-based Experience*, may be desirable.

Essential requirements

Access to library resources appropriate to independent academic research at this level is essential. Learners will also need access to the internet and IT facilities, complete with statistical and presentational software packages.

Learners must agree the use of resources with their supervisors to ensure that appropriate apparatus/equipment, training, health and safety considerations and permissions are all in place before beginning any practical activities.

Employer engagement and vocational contexts

Depending on the individual learner's interests and choice of research project, it may be possible for them to undertake research in conjunction with a business, organisation and/or work experience provider. This could enhance the learning experience by increasing the relevance of the research and improving a learner's employability skills.

Unit 6: Work-based Experience

Unit code: A/601/0998

Level: 5

Credit value: 15

Aim

This unit aims to enable learners to experience the scope and depth of learning which takes place in a work-based context by planning, monitoring and evaluating work experiences.

Unit abstract

A significant amount of learning can be achieved by carrying out practical activities in a workplace. Learning may be enhanced by taking a more formal approach to work-based activities – by planning, carrying out the activities and reflecting on the benefits of the activities to the organisation, business and learner.

Learners will have the opportunity, supported by their supervisors, to negotiate and perform activities which will enable them to achieve work related understanding and skills. They will recognise the scope of what they have achieved by recording evidence of carrying out different activities. Learners will gain maximum benefit by reflecting on, and evaluating of, the work they undertake.

Learning outcomes

On successful completion of this unit a learner will:

1 Be able to negotiate industry experience

2 Understand the specific requirements of the placement

3 Be able to undertake work experience as identified

4 Be able to monitor and evaluate own performance and learning.

Unit content

1 **Be able to negotiate industry experience**

Suitable organisation and location: types of establishments for placement eg industry-related work for a client brief at college, existing work environment, different department within current employer's business; other appropriate industry-related organisations or businesses

Negotiation: methods of contacting organisations; methods of undertaking negotiations

Nature of duties: type of undertaking eg routine duties and tasks, project work, development of new procedures/protocols

Supervisors: roles and responsibilities of academic and industrial mentors

Expectations of learning: aims eg proficiency in new tasks and procedures, time management and problem-solving skills; reflection; discussing progress with others; teamwork

Business constraints: consideration of possible limitations eg need to be fully trained, adherence to quality systems, health and safety considerations, supervision time, workload, customer satisfaction, limited staffing, cost of materials

2 **Understand the specific requirements of the placement**

Tasks: details of activities eg specific hourly, daily, weekly routine and non-routine tasks; breakdown of a project into stages; new procedures/protocols; adherence to health and safety practices

Prioritise: reasons for rationalising the order of tasks; methods of prioritising work

Plan for the work experience: methods used to develop detailed plan with schedule of tasks; proposed dates for reviews; expected input from supervisors

Benefits to organisation and learner: advantages to business eg allowing more routine tasks to be carried out, allowing procedures/techniques to be developed, increasing responsiveness, identifying cost saving measures; advantages to learner eg understanding how a business operates, understanding importance of teamwork, learning new techniques, development of problem-solving and time management skills

3 **Be able to undertake work experience as identified**

Carry out the planned activities: realisation eg carrying out tasks and project work according to relevant legislation, training, health and safety measures and codes of practice; developing new procedures or protocol

Record activities in the appropriate manner: systematic and appropriate recording of relevant activities eg logbook, diary, portfolio, spreadsheets, databases; list of resources

Revise the initial plan as required: methods used to review activities at the appropriate time to see if they meet requirements; make alterations as needed

4 **Be able to monitor and evaluate own performance and learning**

Evaluation of the quality of the work undertaken: meeting industry standards and evaluating own performance against original proposal; comments/testimony from supervisors; adherence to health and safety measures

Account of learning during the work experience: details of experience gained eg new procedures, interpersonal skills, time management, problem solving, teamwork; details of evidence eg portfolio of evidence, scientific report, management report

Recommendations on how the learning experience could have been enhanced: alternative ideas eg different location(s), different brief, different time period, more/less support, better time management, better preparation

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Be able to negotiate industry experience	1.1 research and evaluate suitable organisations that could provide industry experience 1.2 negotiate with work and academic supervisors a proposal for the work experience 1.3 recognise the business constraints on the work experience offered
LO2 Understand the specific requirements of the placement	2.1 agree and prioritise the tasks and responsibilities involved in the work experience 2.2 produce a plan for the work experience 2.3 analyse the benefits of the proposed activities to the business and the learner
LO3. Be able to undertake work experience as identified	3.1 fulfil specified requirements of placement conforming to all related codes of practice 3.2 produce systematic records of work undertaken 3.3 revise the initial plan as required 3.4 make suggestions for improvement and review these with appropriate supervisor
LO4. Be able to monitor and evaluate own performance and learning	4.1 monitor progress against original proposal 4.2 evaluate the quality of own performance 4.3 analyse the learning which has taken place during the work experience using suitable reflections 4.4 make recommendations on how the experience could have been enhanced

Guidance

Links

This unit links with other units in the qualification such as *Unit 1: Business Environment*, *Unit 33: Project Management for Land-based Industries*, *Unit 34: Small Business Enterprise* and *Unit 38: Employability Skills*. Other units that could enhance the learner's experience during placements are *Unit 2: Animal Husbandry Management* and *Unit 3: Animal Health and Welfare*, amongst others, depending on the learner's interests and placement selection. There may also be scope for *Unit 5: Research Project*, to be undertaken in collaboration with placement providers to further enhance the learner's experience and prospects for employment.

Essential requirements

Learners must undertake a minimum of 450 hours work experience in a professional work environment. Given the work-based nature of the unit, the majority of resources used will be those available to the learner in the workplace. Work will normally be planned to be achievable within the resource constraints of the employer. Therefore knowledge of company structures and daily routines and expectations is essential.

Learners should have access to a wide range of research facilities including careers library and/or careers services.

Tutor support and guidance are essential. Learners should remain in contact with tutors during their work experience – email is a good way but some centres may have access to a virtual learning environment where learners can share information and experiences with each other and the tutor.

Employer engagement and vocational contexts

Learners might find it beneficial to describe their placement experiences to peers on completion. Whether this is informal, or as part of an assessment, hearing about each other's placements will broaden the vocational context of the programme area for all learners. Learners may also wish to collect photographs, videos and other materials whilst undertaking their placements to enhance their presentations.

The unit is designed to allow flexibility of study for part-time and full-time learners. It is expected that learners will be supervised in the workplace in addition to the supervision provided by their centre supervisor.

Unit 7: Biological Principles

Unit code: J/503/1057

Level: 5

Credit value: 15

Aim

This unit aims to develop learners' understanding of the biological principles that underpin the management of biological systems. Learners will improve their scientific understanding of the fundamental processes within living organisms and familiarise themselves with basic cell structures and function intrinsic to the existence of living organisms.

Unit abstract

Biological principles are the key to an understanding of the basis of life and are core to learners exploration of living organisms they work with. This will enable learners to understand and interpret a wide range of biological evidence essential to making informed scientific decisions.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the relationship between the structure and function of plant and/or animal cells and tissues

2 Understand the organisation of cells and tissues into organ systems in plants and/or animals

3 Understand the importance and role of homeostasis in plants and/or animals

4 Be able to investigate fundamental biological principles in plants and/or animals

5 Understand basic biochemical principles in plant and/or animals.

Unit content

1 **Understand the relationship between the structure and function of plant and/or animal cells and tissues**

Cellular structure and functions: eukaryotic cell structures (plasma membrane, centrosome, cytoskeleton, peroxisome, mitochondria, lysosome, golgi apparatus, ribosomes, nucleus, rough and smooth endoplasmic reticulum), specialist eukaryotic structures (chloroplasts, cell wall, vacuole, plasmodesmata, cilia, microvilli, flagella) prokaryotic cell structures (nucleoid, ribosomes, plasma membrane, flagella, cell wall, capsule, fimbriae); process of protein production

Tissue structure: key cell and tissue types in plants (eg parenchyma, collenchymas, sclerenchyma, xylem, phloem, dermal tissue, epidermis, cuticle, cork cambium, periderm) and/or animals (eg simple, stratified and pseudostratified epithelial tissue, fluid, dense, irregular and regular connective tissue, smooth, cardiac and skeletal muscle tissue, nervous tissue)

2 **Understand the organisation of cells and tissues into organs systems in plants and/or animals**

Organs and organ systems: key systems in plants (eg stems, meristems, roots, shoots, leaves, reproductive organs) and/or animals (eg peripheral, central, somatic and sympathetic and parasympathetic nervous systems, endocrine, autocrine and paracrine, respiratory and circulatory, digestive system, urinary, musculoskeletal, reproductive, immune, integumentary)

3 **Understand the importance and role of homeostasis in plants and/or animals**

Changing environments: oxygen; carbon dioxide; pH; waste products; temperature; osmolarity; energy source (eg blood glucose and dietary availability), macro and micronutrients (eg lipids, vitamins, minerals)

Mechanisms: feedback loops (negative, positive; set points, acclimatisation; sensors, stimulus, response; end product inhibition; alterations in enzyme activity, gene transcription, intracellular (cascades, second messengers eg calcium, cyclic AMP, cyclic GMP, protein kinases, IP3) and extracellular signalling (hormonal and nervous)

4 **Be able to investigate fundamental biological principles in plants and/or animals**

Planning and carrying out investigations: null hypotheses; predictions based on previous knowledge and observation; selection and competent use of appropriate techniques, randomisation; independent, dependent and confounding variables; use of controls; sampling

Analyses of investigation results: application of relevant statistical tests; potential sources of experimental error; accuracy and validity of experiments; drawing relevant conclusions from data

5 **Understand basic biochemical principles in plants and/or animals**

Chemical structure: functional groups (hydroxyl, carbonyl, carboxyl, amino, sulfhydryl, phosphate, methyl); acids and bases; structures of carbohydrates (monosaccharides, disaccharides, polysaccharides); lipids; proteins (primary, secondary, tertiary, quaternary); nucleic acids

Biochemical reactions: chemical bonding (ionic, covalent, hydrogen, van der Waals); properties of water (polarity, specific heat capacity, solvency, insulation, evaporative cooling); free energy, equilibrium constant, activation energy; catalysts, enzymes; oxidation and reduction; strength, pH and buffering of acids and bases

Transport into and out of cells: diffusion, osmosis, passive and active transport; transporter types (symport, uniport, antiport); vesicle-mediated transport; endocytosis and exocytosis

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the relationship between the structure and function of plant and/or animal cells and tissues	1.1 examine the structure and function of major cell organelles 1.2 explain the differences between prokaryote and eukaryote cells 1.3 explain the process of protein production in the cell 1.4 evaluate the structure of cells as related to their function and arrangement within various tissues
LO2 Understand the organisation of cells and tissues into organ systems in plants and/or animals	2.1 discuss the co-ordination of tissues to form organs 2.2 examine the structure and function of two organ systems in plants and/or animals
LO3 Understand the importance and role of homeostasis in plants and/or animals	3.1 discuss the homeostatic control of major body systems 3.2 explain the mechanisms of action of homeostasis
LO4 Be able to investigate fundamental biological principles in plants and/or animals	4.1 plan practical experiments to investigate a given proposal 4.2 use appropriate techniques to investigate a given proposal 4.3 make appropriate recommendations, based on findings, to inform decisions 4.4 justify recommendations made based on findings
LO5 Understand basic biochemical principles in plants and/or animals	5.1 examine the basic chemical structure of different molecules 5.2 explain basic chemical reactions relevant to biology 5.3 explain the transport of molecules into and out of cells

Guidance

Links

This unit links with the following units in this qualification:

Unit 4: Animal Nutrition

Unit 10: Anatomy and Physiology

Unit 23: Animal Adaptations.

Essential requirements

A well-equipped science laboratory is essential in which learners can plan and carry out practical experiments. Learners must have access to supporting materials including higher level biology and chemistry textbooks.

Employer engagement and vocational contexts

Organisations involved in scientific research, such as industrial or academic laboratories, could enable learners to experience scientific investigation in a range of contexts.

Producers of feed products may be able to provide an industrial context for determining the nutritional content of feed stuffs using chemical methods, which would be valuable for all learners.

Links with producers and retailers may also provide useful experience for learners as well as a source of material for examination. Visits to abattoirs or butchers may help learners to learn the form and function of organ systems in animals.

Unit 8: Horse Husbandry

Unit code: D/503/1680

Level: 4

Credit value: 15

Aim

This unit aims to develop learners' understanding of the daily needs of horses in relation to their comfort, health and welfare. Learners will develop the ability to manage important, regular routines and the application of welfare standards.

Unit abstract

In this unit learners will develop a broad understanding of the regular routines and high standards of welfare which need to be implemented when caring for horses. Learners will be given opportunities to build on their understanding of horse husbandry and apply it in sound, practical settings.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand how to manage and supervise the daily care of stabled and field-kept horses

2 Understand how to manage and supervise stable routines and the maintenance of yards and equipment

3 Understand horse health and care

4 Be able to manage the preparation of horses for given scenarios.

Unit content

1 **Understand how to manage and supervise the daily care of stabled and field-kept horses**

Handling: how to approach a horse; methods of control and restraint; use of appropriate equipment

Safe practices: suitability of handlers' clothing; in relation to horse behaviour

Fitting: stable equipment eg head collars; stable bandages; rugs eg indoor rugs, outdoor rugs, style and use of rug; measuring for rugs

Routines: grooming methods for stabled and field-kept horses and their purpose (comfort, health); purpose and use of different equipment (daily use and maintenance); clips (style, use); maintaining appearance (plaiting, pulling, trimming); health and safety; risk assessment; COSHH; RIDDOR; accident reporting

2 **Understand how to manage and supervise stable and the maintenance of yard and equipment**

Stables: suitability of buildings eg size, ventilation; bedding (types, maintenance, costs, disposal, skipping out, deep litter, disinfecting)

Routines: methods; procedures for cleaning and maintaining stables and yards; types of feed; estimating feed quantity; rules of feeding; preparation of feeds (boiling and soaking, varieties of hay, hay alternatives, haylage, grass nuts); horse feeding needs (shy eater, fussy, obese horse); health and safety; risk assessment; COSHH; RIDDOR; accident reporting

Health and safety around the stable yard: hazard identification; risk assessment procedures; health and safety considerations

3 **Understand horse health and care**

Basic signs: condition scoring; symptoms of health and sickness

Treatments: for health problems and injuries; for weight management; application of dressings, poultices and bandages; use of tubing and hosing; other routine treatments

Foot: structure; care; methods and procedures of shoeing; observation of lameness of a specific limb

Routine medicines: safe use; storage; administration; teeth eg growth, formation, markings in relation to age; contents of vet kit; taking and monitoring TPR

Conformation: abnormalities; stresses to limbs; effects on movement

4 **Be able to manage the preparation of horses for given scenarios**

Horses working equipment: eg saddles, bridles and equipment for exercise, driving harness set, exercise sheets, bandages and boots; safe fitting and use of equipment; use and fitting of the double bridle; functions and fitting of bits

Exercise: procedures for fittening and roughing off; preparation for lungeing; alternative methods of providing exercise from the ground eg long reining

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand how to manage and supervise the daily care of stabled and field-kept horses	1.1 critically compare methods of horse control and restraint to ensure safe handling 1.2 evaluate horse grooming procedures to promote correct muscular development and to ensure horse health and well-being
LO2 Understand how to manage and supervise stable routines and the maintenance of yards and equipment	2.1 analyse food, hay and water requirements for stabled and field kept horses 2.2 critically compare the feeding needs and behaviour of given horses – fussy eater – shy eater – obese 2.3 evaluate methods and procedures for maintaining bedding 2.4 propose appropriate strategies to minimise risks and hazards in stable and yard environments 2.5 justify the management of muck heaps, barns and surrounding areas
LO3 Understand horse health and care	3.1 explain how health assessment and TPR monitoring can diagnose abnormalities 3.2 relate the structure of the horse's foot and abnormalities to the need for specialist care remedial shoeing 3.3 evaluate routine preventative medicines and the primary and secondary treatment of injuries 3.4 explain how abnormalities may influence horse health, soundness and movement 3.5 analyse the formation and structure of teeth and the ageing of the horse through dental markings
LO4 Be able to manage the preparation of horses for given scenarios	4.1 manage the fitting and care of tack and equipment to ensure the safety and comfort of horse and rider

Guidance

Links

This unit links with the following units in this qualification:

Unit 2: Animal Husbandry Management

Unit 3: Animal Health and Welfare

Unit 4: Animal Nutrition

Unit 11: Animal Behaviour.

Essential requirements

Learners need appropriate provision, and of regular access to, a range of horses and equipment. Horses studied must be of different ages, breeds, types and temperaments. Equipment provided must include saddles, snaffle bridles, double bridles, martingales, bits, lungeing equipment, head collars, stable bandages, indoor and outdoor rugs, grooming equipment, general yard equipment, farriery tools and first aid and medical equipment. Access could in part be through work experience or guest lectures, alongside centre-based facilities. Tutors with industry-standard competence in, and experience of, handling horses will also be required.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit.

Employer engagement and vocational contexts

Delivery of this unit could be enhanced through links with employers. For example, local yard owners, horse producers, vets and/or farriers could provide opportunities for practical learning. Learners could visit a number of different types of yards or events, including sales and shows, to observe different working practices and routines.

Learners would also benefit from undertaking work experience in a number of different yard environments to develop their practical skills and build confidence.

Unit 9: Principles of Ecology

Unit code: M/503/1215

Level: 4

Credit value: 15

Aim

The aim of this unit is for learners to understand concepts that underpin all aspects of environmental work, from the commercial exploitation of individual species to the management of whole habitats. The mechanisms of evolution and the implications of this are considered and applied throughout delivery of the unit.

Unit abstract

In this unit learners will develop an understanding of the essential background of evolution that forms the framework for all modern biology. Learners can apply their understanding to the interrelationships between living organisms and their environments. The factors controlling the distribution of and changes in populations are also considered and related to habitat formation and management.

Learners will have the opportunity to investigate a range of different habitat types practically and use their understanding to predict how these may change. They will also evaluate the techniques used to manage a range of ecosystems.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the mechanisms and ecological implications of evolution

2 Understand factors affecting the distribution of populations

3 Understand mechanisms governing fluctuations and stability within populations

4 Be able to predict temporal changes in plant and animal communities in named terrestrial and aquatic ecosystems.

Unit content

1 **Understand the mechanisms and ecological implications of evolution**

Mechanisms: natural selection (progressive/directional); stabilising; selection pressure; other kinds of selection eg species, group, kin, sexual, individual, artificial; alternative explanations of the evidence for evolution eg punctuated equilibrium, selfish gene theory

Ecological implications: adaptations (anatomical, physiological, morphological and behavioural); speciation; optimality and evolutionary stable strategies; coevolution; symbiotic relationships; species extinction; genetic extinction; population genetics; biodiversity; symbiotic relationships (parasitism, commensalism, mutualism)

2 **Understand factors affecting the distribution of populations**

Distribution: geographic; zonation; regular; random; clumped; temporal eg diurnal, crepuscular and nocturnal communities

Factors: competition; predation; tolerance of abiotic environments eg stenotopic and eurytopic organisms; acclimation; dormancy; adaptation; physiological and behavioural homeostasis; historical eg evidence of geographical changes – pollen record, geology, fossil record; human eg disruption of migratory paths, culling, hunting, breeding programmes, predator control, introductions; dispersal eg limited or developed powers of dispersal

3 **Understand mechanisms governing fluctuations and stability within populations**

Dynamics: life tables; age distributions; demographics; geometric and logistic growth curves; carrying capacity; *r* selection; *K* selection

Mechanisms: climate and seasonality; productivity and energy relationships; biological rhythms; symbiosis; predation; competition; reproductive value; natural regulation eg density dependent and independent factors

4 **Be able to predict temporal changes in plant and animal communities in named terrestrial and aquatic ecosystems**

Temporal changes: investigation of a range of communities and the successional stages observed; primary and secondary succession; late successional; arrested; sub-climax; climax

Explanatory mechanisms for temporal changes: facilitation model; inhibition model; tolerance model

Manipulation of ecosystems: drainage; flooding; burning; grazing; species introduction

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the mechanisms and ecological implications of evolution	1.1 explain the mechanisms of evolution in a given context 1.2 evaluate how organisms adapt to their environment 1.3 evaluate the importance of population genetics in the conservation of biodiversity
LO2 Understand factors affecting the distribution of populations	2.1 explain the distribution of named plant and animal species and populations 2.2 explain the factors influencing the distribution of named plant and animal species
LO3 Understand mechanisms governing fluctuations and stability within populations	3.1 examine the population dynamics of named populations 3.2 analyse the factors influencing the numbers and demographics of named populations
LO4 Be able to predict temporal changes in plant and animal communities in named terrestrial and aquatic ecosystems	4.1 examine climax and sub-climax communities in given terrestrial and aquatic ecosystems 4.2 predict temporal changes in named communities 4.3 recommend valid strategies to manage named sub-climax communities

Guidance

Links

An understanding and appreciation of ecology is key to recognising why governments need to follow a more sustainable path to development, and as such this unit links not only with the *Unit 32: Sustainable Development* unit, but also with broader government and international policies and protocols.

Essential requirements

Learners must have access to a range of habitats to investigate and contrast in particular study visits will enable more detailed investigations.

In addition, equipment for monitoring populations of both plants and animals should be available for learners to use.

Learners will need access to library resources, and a number of multimedia resources should be available to support ecological study.

Employer engagement and vocational contexts

Learners could be introduced to a variety of professionals for example ecologists, country and park rangers, gamekeepers etc, either as guest speakers or on off-site visits to different establishments. This will broaden their depth of knowledge, enhance and contextualise their learning experience. Relating the unit content to the work of organisations such as wildlife trusts (the County Trusts in England and Wales and the Scottish Wildlife Trust), the Royal Society for the Protection of Birds (RSPB) and the Worldwide Fund for Nature (WWF) will strengthen the vocational relevance.

Visits to museums with a broad range of natural history specimens would promote a greater understanding of evolution and biodiversity and would introduce learners to heritage-based professions.

Unit 10: Anatomy and Physiology

Unit code: K/503/1682

Level: 4

Credit value: 15

Aim

This unit aims to develop learner understanding of physical support and movement in animals, body transport systems, the acquisition of materials and removal of waste, and animal reproduction.

Unit abstract

In this unit learners will develop understanding of the structure, function and maintenance of the animal body.

They will develop understanding of how animal bodies are supported physically and achieve movement, using bones and muscles. Learners will examine the different systems within the animal body and how they contribute to metabolism and waste excretion to maintain health. Learners will also research how new animals are produced through study of reproductive anatomy and physiology.

The unit helps learners to apply understanding of environmental requirements, effective monitoring of animal health and successful animal management.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand how animals achieve physiological support and movement

2 Understand body transport systems

3 Understand how animals obtain raw materials for metabolism and excrete waste

4 Understand animal reproductive processes.

Unit content

1 **Understand how animals achieve physiological support and movement**

Support: functions and types of bones; types, structure and composition of bone tissue; ossification and bone growth; bone homeostasis; hydrostatic skeleton, exoskeleton, endoskeleton, axial skeleton, appendicular skeleton; types of joint (fibrous, cartilaginous, synovial), characteristics of synovial joints, movements at synovial joints

Movement: functions and general characteristics of muscle tissue; types, structure and composition of muscle tissue (skeletal, smooth, cardiac); muscle nerve supply; muscle contraction in different muscle types (eg initiation, sliding filament theory, excitation-contraction coupling, role of calcium); adaptations to different types of movement (eg swimming, flying, hopping)

2 **Understand body transport systems**

Blood: composition and functions of blood; blood plasma; structure and functions of erythrocytes; Bohr effect; structure and functions of leucocytes eg neutrophils, eosinophils, basophils, lymphocytes, monocytes, macrophages; platelets; haemostasis

Cardiovascular system: structure and functions of the heart; origin and conduction of the heartbeat; cardiac cycle; structure and functions of blood vessels; circulatory physiology (blood flow, peripheral resistance, blood pressure, capillary exchange); circulatory pathways (pulmonary circulation, systemic circulation, coronary circulation)

Lymphatic system: lymphatic vessels; formation and transport of lymph; structure, location and functions of lymph nodes; lymphoid tissues/organs

3 **Understand how animals obtain raw materials for metabolism and excrete waste**

Metabolism and waste: catabolism and anabolism; effect of accumulation of waste products

Respiratory system: structure and function of the respiratory tract; ventilation of lungs; gaseous exchange; transport of respiratory gases (plasma, haemoglobin); features of respiratory surfaces

Digestive system: structure and functions of the organs of the digestive tract; phases of digestion and absorption; digestive enzymes; neural and hormonal control of digestion

Urinary system: basic layout of the urinary system; structure and functions of the kidney; roles of ADH and aldosterone; urine formation; pH regulation

Liver: structure of the liver and biliary tract; functions of the liver (eg bile production, synthesis, detoxification, storage, metabolism)

4 **Understand the reproductive processes by which new individuals are produced**

Reproductive system: structure and functions of the male and female reproductive systems; reproductive cycles; hormonal control; spermatogenesis and oogenesis

Reproductive stages as appropriate: sexual maturity and modes of reproduction (eg heterosexual, hermaphroditic, parthenogenetic); fertilisation; implantation/egg and shell production; embryonic development to parturition/hatching

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand how animals achieve physiological support and movement	1.1 explain the structure and function of different types of bone and muscle 1.2 explain the general structure of the skeleton 1.3 examine the characteristics of the different types of joint and movements 1.4 explain how the contraction of skeletal muscle is brought about
LO2 Understand body transport systems	2.1 discuss the composition and functions of blood 2.2 explain the structure of the cardiovascular system 2.3 explain how the cardiovascular system functions to transport materials around the body 2.4 explain the structure and functions of the lymphatic system
LO3 Understand how animals obtain raw materials for metabolism and excrete waste	3.1 examine the structure of the respiratory, digestive and urinary systems 3.2 explain the movement of respiratory gases into, around and out of the body 3.3 explain how the digestive system functions and is controlled 3.4 explain how the kidney functions to produce urine and maintain homeostasis
LO4 Understand animal reproductive processes	4.1 explain the structure and functions of the male and female reproductive systems 4.2 examine the hormonal control of reproduction 4.3 explain how fertilisation occurs and the subsequent development of offspring

Guidance

Links

This unit links to, and is underpinned by, *Unit 7: Biological Principles*.

There are also links with core *units Unit 3: Animal Health and Welfare* and *Unit 4: Animal Nutrition* and specialist units *Unit 11: Animal Behaviour*, *Unit 19: Production Animal Management*,
Unit 23: Animal Adaptations and *Unit 29: Plan and Manage Breeding Programmes for Animals*.

These links may enable for an integrated approach to the delivery and assessment of these units.

Essential requirements

Learners will need access to library facilities with scientific textbooks suitable for level 3 and above and access to the internet.

Access to use of laboratory facilities is needed to enable learners to carry out practical investigations.

Employer engagement and vocational contexts

A working understanding of animal anatomy and physiology is essential in a variety of fields within animal management, including veterinary work, agriculture, veterinary pathology laboratories and animal grooming. Employers could be invited to discuss their work to put the unit into a vocational context for learners.

Veterinary surgeries, veterinary laboratories and clinical laboratories would give learners useful experience of putting theory into practice, especially if they are able to follow clinical cases through. The learning experience would be greatly enhanced if learners could examine healthy and unhealthy specimens from a range of animals and organs.

Unit 11: Animal Behaviour

Unit code: M/503/1683

Level: 5

Credit value: 15

Aim

This unit aims to develop learner understanding of the relationship between environmental and evolutionary pressures on resulting behaviours in a variety of contexts eg animal collections, production livestock and conservation programmes. The unit will include a historical overview of a range of controlled behavioural studies enabling students to differentiate and recognise the relationship between ethology and behavioural physiology and provide an applied basis for animal training.

Unit abstract

The ability to interpret and understand animal behaviour is a valuable skill when working with animals. An applied knowledge of animal behaviour is a crucial element in understanding how to appropriately manage animals, both in captivity (ex situ) and the wild (in situ). This unit will include a historical overview of a range of controlled behavioural studies enabling students to differentiate and recognise the relationship between ethology and behavioural physiology and understand the subsequent impact on animal welfare requirements. This unit will introduce the learner to the theoretical principles of motivation and stimulus response sequences and the development of practical assessment skills. Learners will be able to use a range of underpinning concepts in an applied context eg training.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the scientific basis for controlling animal behaviour

2 Understand the principles and practice of animal behaviour assessment

3 Understand the importance of functional behaviour to social interaction, feeding and reproduction in a range of species

4 Understand the implications of animal behaviour for animal welfare, husbandry and management.

Unit content

1 **Understand the scientific basis for controlling animal behaviour**

Historical interpretation of controlling animal behaviour: Niko Tinbergen (proximate and ultimate questions); changing trends in the study of behaviour and key protagonists (behaviourism, cognitive psychology, Skinner, Lorenz, Lashley); the ethological approach; the experimental psychology approach

Neuro-physiological control of behaviour: stimulus – response sequences; detection, perception and senses; stimuli; neurophysiological co-ordination; reflex responses; motivation as a feature of abnormal behaviours; orientation behaviours

Genetic control and evolutionary significance of behaviour in animals: gene pools; speciation; islandisation; genetic drift; natural selection

Theories of conditioning and learning in animal species: non-associative learning (sensitization, habituation), associative learning (classical conditioning, operant conditioning), social learning, insight learning

2 **Understand the principles and practice animal behaviour assessment**

Animal behavioural assessment: preference, aversion and motivation testing; ethological verses experimental approaches, ethograms

Sampling Stragtegies: Continuous; Instantaneous; Ad. Libitum; Focal; Scanning; Zero-one

Animal behavioural studies: statistical analysis; graphical representation; significance of comparative time budgets; evaluation and application eg assessment of qualitative/quantitative behavioural changes to indicate abnormal behaviours

3 **Understand the importance of functional behaviour to social interaction, feeding and reproduction in a range of species**

Roles of communicative behaviour in animals: methods of communication; medium; modality; benefits and limitations of each; intraspecific; interspecific; honest signals; evolutionary deceits

Concepts of altruism and symbiotic associations: kin selection; co-evolution; modelling eg 'The Prisoners Dilemma'

Theories of predation and feeding: optimality theory; predator-prey cycling; defence behaviour; Batesian and Mullerian mimicry; territoriality

Reproductive behaviour: reproductive strategies; sexual selection; copulation; gestation; parturition; nursing; infanticide

4 **Understand the implications of animal behaviour for animal husbandry and management**

Application of learning theory to training: positive & negative reinforcement; positive & negative punishment; flooding; counter-conditioning; schedule of re-inforcement

Practical significance of applied ethology: welfare; conservation; exploitation; training; management;

Motivation and the development of abnormal behaviours: the relationship between ex-situ management systems and the development of stereotypes

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the scientific basis for controlling animal behaviour	1.1 explain, with reference to key researchers how approaches to the study of animal behaviour have changed over time 1.2 discuss the neuro-physiological control of behaviour 1.3 critically review the effect of genetic and environmental interactions in relation to evolutionary behaviour 1.4 discuss the theories of conditioning and learning in animal species
LO2 Understand the principles and practice of animal behaviour assessment	2.1 explain the practical applications and limitations of a range of assessment strategies 2.2 select appropriate sampling and recording techniques for the practical assessment of behaviour in a named animal species 2.3 evaluate experimental observations and use as a basis for management recommendations
LO3 Understand the importance of functional behaviour to social interaction, feeding and reproduction in a range of species	3.1 evaluate the roles of communication in animals 3.2 discuss the concepts of altruism and symbiotic associations 3.3 critically review the theories of predation and feeding in a range of animal species 3.4 critically review and compare the reproductive behaviours of animal species
LO4 Understand the implications of animal behaviour for animal husbandry and management	4.1 explain the practical significance of applied ethology in a range of contexts 4.2 apply principles of learning theory to the development of potential training regimens 4.3 review the significance of motivation in the development of abnormal behaviours in ex situ environments

Guidance

Links

This unit is closely linked to *Unit 2: Animal Husbandry Management*, *Unit 3: Animal Health and Welfare* and *Unit 13: Animal Law and Ethics*.

Essential requirements

Learners must have access to a range of animals in a range of environments to ensure they can study a range of animal species and their behaviours over a period of time. The centre's own animal facility could provide opportunities to study animal behaviour on a regular basis but visits to a range of animal collections will enable learners to understand the effects of management systems on animal behaviour, as well as to study a wider range of species.

Access to appropriate behaviour monitoring equipment, for example video cameras, is essential along with access to specialist books, journals and periodicals to develop higher level and independent study skills.

Employer engagement and vocational contexts

Appropriate employers could be linked with to support the delivery of this unit. Employers could help tutors in the development of the programme of learning, provision of guest speakers or in the design of assessment activities.

Learners should be encouraged to use their own experience and circumstances to observe animals and investigate behaviour. Visiting speakers and visits to a wide range of animal collections are an essential part of the delivery of this unit, so learners can gain industry-standard experience from professionals working within the field of animal behaviour.

Sustained links with animal collections may support other units within the qualification as well as work placements.

Unit 12: Genetics and their Application

Unit code: L/503/1559

Level: 5

Credit value: 15

Aim

This unit aims to give learners understanding of the structure, transmission and function of genetic material and opportunities to research the principles and implications of biotechnology.

Unit abstract

Genetics is one of the fastest developing areas of science. The associated emerging techniques and technologies continue to offer benefits but are not without potential risk. In this unit learners will gain a fundamental understanding of the principles behind genetics, and the application of a range of genetic manipulation techniques. This understanding is essential for people producing and monitoring successful breeding programmes, as well as to the evaluation of emerging technologies. Learners will research the use of these techniques and review the range of opinions that surround their use.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the structure of genetic material and the cellular mechanism of heredity

2 Understand the mechanism of heredity at the organism, population and species level

3 Understand a variety of genetic manipulation techniques and their application to industry

4 Understand the potential impacts of biotechnology.

Unit content

1 **Understand the structure of genetic material and the cellular mechanism of heredity**

Structure of genetic material: DNA; double helix; major and minor grooves; sugar-phosphate backbone; base pairing including differentiating between purines and pyrimidines; nucleosomes; looped domains; chromosomes; RNA, mRNA, rRNA, tRNA; genome size and organisation; transposable elements

Cellular mechanism of heredity: semiconservative mechanism of DNA replication; components of the replication fork and their function; antiparallel elongation; proofreading and repairing; telomeres; transcription initiation, elongation, termination and post-transcriptional modification; splicing of mRNA, translation initiation; elongation; termination; protein folding and post-translational modifications; stages of meiosis and mitosis including events that result in non-Mendelian inheritance (eg crossing over) and epigentics

2 **Understand the mechanism of heredity at the organism, population and species level**

Organism level: monohybrid and dihybrid, crosses; sex determination; dominance, co-dominance; pleiotrophy; epistasis; multifactorial traits; imprinting; hybridisation

Population and species level: pedigree analysis; including dominant; recessive and sex linked inheritance; gene pools, allele frequencies; Hardy-Weinburg equilibrium (principle and application); effects of genetic drift, gene flow, mutation (missense, nonsense, samesence and frameshift mutations); migration and selection; founder and bottleneck effects

3 **Understand a variety of genetic manipulation techniques and their application to industry**

Techniques: bacterial transfection and cloning; PCR; genomic sequencing; cloning higher organisms; stem cell technologies; gene therapy; genetic screening; synthesis of pharmaceutical products in model organisms; ‘knock-out’ and ‘knock-in’ models

Application: to include disease treatment, genetic screening, synthesis of pharmaceutical products, traceability of inputs and outputs, design and monitoring of breeding programmes, production of resistant organisms; subject-specific examples (eg pedigree disputes, disease resistant organisms, tracing feedstuffs)

4 **Understand the potential impacts of biotechnology**

Impacts: positive and negative impacts eg health, welfare, diversity, environmental, economic, social; public opinion including the influence of a range of organisations eg academia, industry, government agencies, NGOs, charities and consumer groups

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the structure of genetic material and the cellular mechanism of heredity	1.1 examine the structure of genetic material 1.2 explain the mechanism of replication and protein synthesis 1.3 explain the main stages of meiosis and mitosis
LO2 Understand the mechanism of heredity at the organism, population and species level	2.1 analyse the results of monohybrid and dihybrid crosses including gene linkage 2.2 analyse the results of crosses involving sex linkage 2.3 analyse the effects of family pedigrees on inheritance 2.4 discuss the factors affecting gene frequency
LO3 Understand a variety of genetic manipulation techniques and their application to industry	3.1 explain the use of molecular biology techniques for important DNA manipulations 3.2 review the use of gene cloning in land-based industries
LO4 Understand the potential impacts of biotechnology	4.1 compare the positive aspects of new genetic technologies 4.2 assess the potentially harmful aspects of new genetic technologies 4.3 evaluate public opinion, nationally and internationally, to new genetic technologies

Guidance

Links

This unit links with the following units in this qualification:

Unit 7: Biological Principles

Unit 13: Animal Law and Ethics

Unit 29: Plan and Manage Breeding Programmes for Animals.

Essential requirements

Learners will need access to a range of media to enable them to review and research the application of genetic manipulation techniques, including textbooks, newspapers, websites and scientific journals.

Employer engagement and vocational contexts

Centres would benefit from links with organisations which research, evaluate and/or use genetic technologies. These may include universities, research institutes, pharmaceutical companies and/or biotechnology companies.

Commercial animal or plant breeders would be useful contacts as would producers and organisations using genetic techniques to support conservation or environmental monitoring programmes.

Unit 13: Animal Law and Ethics

Unit code: T/503/1684

Level: 5

Credit value: 15

Aim

This unit aims to focus on legislation related to animals; its application, enforcement and the interrelationship with ethical considerations. Through developing an understanding of Global, EU and National law, learners will be able to evaluate the provisions and effectiveness of current legislation relating to the broad topic of animal management.

Unit abstract

In this unit learners will develop a critical understanding of law and the ethical and moral constraints that potentially impact on animal management. A historical overview of those principles and practices which have contributed to our contemporary viewpoint will also be considered.

The unit will give learners with understanding of sources of law and legislative procedures within the UK and Europe their relevance to animal management. This unit will equip learners with an understanding of key benchmarking statements within animal law eg ‘due diligence’, ‘duty of care’ ‘unneccesary suffering’ and promote consideration of the conflicting priorities within statute. Crucially, this unit will introduce learners to the constructs of ethical debate and develop the reasoning and analytical skills that will be required in further units

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the principle schools of ethical thought and the rationale that attributes moral standing to non-human animal species

2 Understand process and practice of EU legislation and its comparative implementation by member states in National Law

3 Understand key aspects of legislation which apply to people and the well-being of animals

4 Understand challenging issues in the context of animal management.

Unit content

1 **Understand the principle schools of ethical thought and the rationale that attributes moral standing to non-human animal species**

Origin of ethics: definitions of terms used in ethics; the concept of morality and its measurement; the existence of universal moral values; ancient ethics underpinning modern philosophy; ethical perspectives as applied to animals (eg Utilitarianism, Agent Centred, animal rights, species intergrity)

Moral philosophy and theories: relevant overview of ancient and modern philosophy considerating of the corresponding developments in science and technology; main theories which provide guidelines for the conduct of individuals in different societies such as Kantian ethics, the categorical imperative, Jan Narveson, Bentham

Specific factors: gender; feminism; socio-economic; religion; politics

Moral orthodoxy of a range of societies: examples of the attitudes and conduct towards animals in small-scale societies (tribal societies, nomadic peoples, western world, developing world, aboriginal societies and the ethical derivations of these attitudes); determination of the moral status of animals in different societies

2 **Understand process and practice of EU legislation and its comparative implementation by member states in National Law**

Role of law and legal systems: as a framework to implement a code of conduct for a society; public control; links between law, society and morality

Legal perspectives relevant to animals: consideration of Civil verses Criminal law; the role of the CPS and RSPCA in bringing criminal prosecutions

New legislation: sources of law; Acts of Parliament; delegated legislation process; types of statute; delegated legislation (eg regulations, devolution, case law, precedent)

European and UK legislation: influence of EU legislation; regulations; directives and decisions; Treaties and Conventions, European law; relationship between EU and UK legislation; Key statute eg Treaty of Amsterdam, Lisbon Treaty

3 **Understand key aspects of legislation which apply to people and the well-being of animals**

Core areas of human-animal interaction: introduction to basic legal concepts as necessary to understand the law and enable its interpretation; overview of the branches of law and specific current laws relating animals (eg to domestic/companion animals, animals in agriculture, animals in sport and entertainment, Regulated [scientific] procedures, AWA 2006, WASK 1995, A(SP) A 1986, WATO 2007, Veterinary Surgeons Act 1966); wildlife provision including international influences with regard to the protection of endangered species, implementation of European directives relating to animals, local laws and policy making

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Legislative Interpretation and implementation: evaluation of benchmarking statements to include 'duty of care', 'due diligence', 'liability', 'unneccessary suffering'

Effectiveness of current legal provision: enforcement issues and examples of prosecution successes/failures; recognised loopholes; species specific inconsistencies; conflict with human rights and socio economic priorities; bodies enforcing animal laws

4 **Understand challenging issues in the context of animal management**

Identification of issues: regulated procedures, slaughter (to include religious slaughter), hunting (to include Whaling); farming methods; species-specific inconsistencies

Historical and contemporary attitudes: overview of development of animal law through major periods of history (eg Ancient Greece, Rome, Middle Ages and nineteenth century onwards);

Legal-ethical debates: utilitarianism versus animal welfare and rights; animals as property and failure to recognise sentiency in all provision; the limits to sentiency and consciousness in directing legislation; the views of proponents and antagonists

Conflict between morality and animal law: the balance of moral and legal rights; legislation that regulates the contentious use of animals; aspects of provision of law for core areas of human-animal activity

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**		Assessment criteria for pass **The learner can:**	
LO1	Understand the principle schools of ethical thought and the rationale that attributes moral standing to non-human animal species	1.1	critically review a range of ethical viewpoints
		1.2	analyse moral philosophy and the moral theories that influence social conduct, specifically in respect of animals
		1.3	evaluate those factors likely to contribute to ethical views
		1.4	discuss historical and contemporary legal attitudes to animals and determine the links with moral theory
LO2	Understand process and practice of EU legislation and its comparative implementation by member states in National Law	2.1	explain the role of law and legal systems in societies
		2.3	discuss the mechanisms by which new legislation is formulated in the UK and Europe
		2.4	explain the relationship between European/international law and UK legislation
		2.5	review the international significance of key EU statutes
LO3	Understand key aspects of legislation which apply to people and the well-being of animals	3.1	review those key areas of the law that relate to human-animal interaction
		3.2	analyse the relationship between human rights legislation and the effective provision of animal welfare legislation
		3.3	explain the application and interpretation of key benchmarking statement to include: ‘duty of care’ ‘due diligence’ and ‘unnecessary suffering’
		3.4	identify areas of species specific inconsistencies within animal law
LO4	Understand challenging issues in the context of animal management	4.1	summarise the current legal provision relating to contentious areas of human-animal interaction
		4.2	review the effectiveness of current legal provision through the analysis of enforcement issues and case examples
		4.3	critically review areas of moral conflict in the application of animal welfare law
		4.4	evaluate the ethical arguments posed by all protagonists for a named area of human-animal interactions

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Guidance

Links

Since an ethical and legal viewpoint applies to all aspects of human interaction with animals, this unit links to many other animal management units. Specific aspects of law may be emphasised in units such as *Unit 2: Animal Husbandry Management*, *Unit 14: Animal Industry and Trade*, *Unit 18: Animal Nursing* and *Unit 20: Exotics and the Pet Trade.* A basic knowledge of legal systems will also provide a background for non-animal related legal considerations in the business units, for example health and safety legislation.

An understanding of the legal and ethical aspects covered in *Unit 32:* of *Sustainable Development* will be enhanced through studying this unit.

Essential requirements

This unit would be enhanced by access to archive information. It would be useful to provide IT access to current legislation and European directives/regulations, for example OPSI and europa.

Tutors need to be familiar with legal systems and animal law in addition to providing the necessary ethical background. Specialist speakers or visits may be useful in enhancing the quality of the learning experience by enabling learners to recognise the role that ethics and law play in industrial practices.

Employer engagement and vocational contexts

A team of employers could be identified to support the different units. Employers could help tutors for example, with the planning of programmes of learning, or provision of visits, guest speakers and mentors. They could also help to design assessment activities

Delivery of this unit would be enhanced by involving employers such as those with a knowledge of current legislation (eg relating to domestic/companion animals, animals in agriculture, animals in sport and entertainment) or of wildlife provision including international influences regarding the protection of endangered species.

Unit 14: Animal Industry and Trade

Unit code: A/503/1685

Level: 5

Credit value: 15

Aim

The aim of this unit is to enable learners to understand the structure of the animal industry and the long- and short-term implications for domestic and wild animals. Learners will investigate the industry itself in the light of political events on a national and worldwide scale, related bodies and relevant legislation.

Unit abstract

In today's society, it is important that learners who wish to work with animals are guided in the economics, industry and trade of their chosen profession. The sensitive and sometimes controversial subject of animal trade is increasing, despite publicly-led campaigns in recent years. This unit covers the subjects surrounding animal trade. Learners will explore issues surrounding animal trade and the effects it has on economies and organisations locally, nationally and internationally.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the significance of the animal trade to the economy

2 Understand the legal and regulatory environment in which animal trade operates

3 Understand effects of animal trade on wild animal populations

4 Understand issues relating to the welfare of animals during trade, care of stock in transit and quarantine arrangements.

Unit content

1 **Understand the significance of the animal trade to the economy**

Status: import and export statistics for the UK; species distribution and their status in the wild; financial statistics of the trade; size/structure and distribution of the animal trade market

Trading structures: personnel involved in buying, selling and dealing with animals; common locations of supply to the trade; routes and destinations; economic implications

Economic factors: price and cost; supply and demand; competition; value of exports to source and destination area; reasons for import and export – pet trade, private collections

2 **Understand the legal and regulatory environment in which animal trade operates**

Organisations and bodies: CITES, IUCN, EU; legislating authorities; HM Revenue and Customs; roles and responsibilities of the authorities; policing authorities and their powers in the animal trade and industry

Legislation: import and export legislation; quarantine legislation and vaccination; trade barriers (religion, disease prevention, disease control), restrictions on legislation; law enforcement and establishments; species requirements under legislation; analysis of the effectiveness of current import/export legislation

3 **Understand the effects of animal trade on wild animal populations**

Effects on wild populations: imbalance of the local ecosystem and biodiversity; maximum sustainable yields; capture and trapping; mortality rates of captured/ trapped animals

Alternative sources of animals and trade: ranching; farming; captive breeding; conservation projects; animal derivatives; eco-tourism

Advantages and disadvantages of alternatives: use of existing stock; conservation; genetic integrity; education; financial advantages; disease

4 **Understand issues relating to the welfare of animals during trade, care of stock in transit and quarantine arrangements**

Welfare during trade: transportation and mortality rates; high mortality prevention; legislation regarding transport times and care of animals in transit; role of authorities and organisations with interests in the transport of animals; illegal transport (smuggling, implications on animals welfare); animal housing during transit; quarantine and necessary vaccinations/care and veterinary checks; locations for quarantine; necessary quarantine times

Implications of disease: prevalence and how this is affected by animal trade; control of disease during trade and transport – vaccination; isolation of affected cases; quarantine

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the significance of the animal trade to the economy	1.1 review the status of the animal industry and animal trade 1.2 discuss the implications of trading structures within international animal trade 1.3 explain the economic factors underpinning the animal trade
LO2 Understand the legal and regulatory environment in which animal trade operates	2.1 examine laws governing the trade of animals 2.2 compare the role of key organisations in regulating and monitoring animal trade 2.3 critically assess the effectiveness of key organisations in regulating and monitoring animal trade 2.4 discuss the effectiveness of the existing quarantine legislation
LO3 Understand effects of animal trade on animal wild populations of animals	3.1 evaluate the sustainable resources of animals for trade 3.2 explain the influences of trading on wild animal populations and their ecosystems 3.3 evaluate the advantages and disadvantages of importing animals and of captive breeding programmes 3.4 compare alternative forms of animal trade
LO4 Understand issues relating to the welfare of animals during trade, care of stock in transit and quarantine arrangements	4.1 examine animal welfare issues of concern in the animal trade 4.2 assess the implications of animal disease for world animal trade

Guidance

Links

This unit has links with the following units in the qualification:

Unit 2: Animal Husbandry Management

Unit 13: Animal Law and Ethics

Unit 16: Management of Animal Collections

Unit 19: Production Animal Management.

Essential requirements

Learners must have access to current reference sources related to the trade and industry of animals including recent transport requirements.

Employer engagement and vocational contexts

Visits to, or guest speakers from, animal trade organisations and enforcement agencies could enhance delivery of this unit, as well as visits to quarantine areas and discussion with veterinary professionals involved in the process.

Learners could explore organisations related to animal movement from one country to another in the form of guest speakers, movement paperwork, and license applications. Learners could assess the impact of the movement of these animals, reasons for moving of them and the financial involvement of moving the animals between areas.

A tutor-guided talk or presentation from HM Revenue and Customs, the police, other personnel involved with the movement and control of animals between countries, a pet shop or zoo owner who regulary imports and exports animals or a private collector could be beneficial in helping learners to form a balanced view of the animal trade and industry.

Unit 15: Principles of Animal Health

Unit code: F/503/1686

Level: 5

Credit value: 15

Aim

This unit aims to develop learners' understanding of animal health. Learners will have the opportunity to investigate the nature of the disease process and examine the relationship between the host and the infective agent.

Unit abstract

Animal health and welfare are important to owners and professionals working in animal management and learners need to understand the mechanisms of disease and immunity, and how these can be adjusted and manipulated to maintain the animal health and welfare.

The unit covers scientific aspects of animal health and ill-health and the management of specific diseases and injuries as well as the use of veterinary medicines to treat and prevent ill health.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the role of the immune system in animals

2 Understand the nature and process of disease and the relationship between the host and the infective agent

3 Understand the appropriate management of specific diseases and injuries in animals

4 Understand the safe use of veterinary medicines.

Unit content

1 **Understand the role of the immune system in animals**

Disease and immunity: structure of the immune system*;* T-cells; B-cells; natural killer cells; phagocytes; platelets; thymus; spleen; interaction between different immunities; compromised immunity (causes and effects)

Innate and adaptive immunity: exterior defences; complement and interferons; inflammation; antibodies; antigens; integrated defence mechanisms

Cellular immunity: T-cell functions; antigen presenting cells; cell mediated cytotoxicity; macrophages; lymphokines

Humoral immunity: antigen-antibody binding; affinity and avidity; methods of action

2 **Understand the nature and process of disease and the relationship between the host and the infective agent**

Epidemiology: reservoirs; host resistance; host susceptibility; control strategies; epidemiological methods

Diagnosis: sample collection; haematology; biochemistry; microscopic examination; bacterial examination; immunological examination; interpreting results against benchmarks

Host-pathogen relationships: host properties; pathogen properties; consequences of exposure; spread of infection; mechanisms of tissue injury

3 **Understand the appropriate management of specific diseases and injuries in animals**

Diseases and conditions: causal agents; aetiology; signs; effects; prognosis; prevention and treatment; metabolic diseases; diet-related conditions; ectoparasites and endoparasites; lifecycle; signs; effects; prognosis; prevention and treatment; haemorrhage; wounds; sprains; strains; dislocations; fractures; head, internal and limb injuries; zoonoses; anthroponotics; notifiable diseases; contagious diseases; management of a disease outbreak

First aid: roles and limitations; conditions necessitating first aid; first aid procedures; first aid kits; wound management and bandaging techniques

Nursing techniques: disinfection; asepsis and sterilisation; isolation and quarantine; barrier nursing; nursing practices; veterinary referral; ethical treatments; euthanasia; disposal of cadavers and clinical waste

4 **Understand the safe use of veterinary medicines**

Legislation: Medicines Act 1968; Misuse of Drugs Act 1971; Misuse of Drugs Regulations 1985; Medicines Regulations 1994; Health and Safety at Work Act 1974; COSHH

Pharmacology: categories; classes and schedules of drugs; pharmacological terminology; dose calculations; contraindications; risks (toxic effects, lethal doses, storage, handling); therapeutic index; methods and routes of administrating medication; safe storage; handling; administration and disposal of medication

Alternative therapies: homeopathy; osteopathy; chiropracty; physiotherapy; acupuncture; aromatherapy; shiatsu; reiki; herbalism

Supply of veterinary medicines: role of the veterinary surgeon, veterinary nurse and other suitably qualified persons (SQP's) in the control and supply of veterinary medicines; restrictions on the SQP e.g. supply of POM-VPS, NFA-VPS and AVM-GSL only; role of AMTRA; CPD requirements of AMTRA; premises registration and requirements for supply of veterinary medicines; role of AMI (Animal Medicines Inspectorate); Veterinary Medicines Regulations 2005

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the role of the immune system in animals	1.1 describe the structure of the immune system 1.2 explain the difference between innate and adaptive immunity 1.3 summarise the roles of humoral and cellular immunity during and after infections 1.4 discuss the interaction between cellular and humoral immunity during infection
LO2 Understand the nature and process of disease and the relationship between the host and the infective agent	2.1 discuss the epidemiological aspects of important veterinary infections 2.2 interpret the results from different diagnostic procedures accurately 2.3 explain the outcome of different host-parasite relationships
LO3 Understand the appropriate management of specific diseases and injuries in animals	3.1 explain the cause, effect, prevention and treatment of common animal diseases 3.2 discuss the management of zoonotic, anthroponotic and notifable disease outbreaks 3.3 evaluate the effect of common endo- and ectoparasites in relation to animal health, to include life-cycles, prevention and treatment 3.4 discuss appropriate first aid treatment for a range of trauma conditions and their subsequent management techniques 3.5 critically review nursing techniques available for a range of given animal health scenarios
LO4 Understand the safe use of veterinary medicines	4.1 review the legislation relating to the use of veterinary medicines 4.2 evaluate the role and risks of pharmacology in the treatment of disease 4.3 discuss the increasing use of alternative therapies

Guidance

Links

This unit links to the following units in this qualification:

Unit 2: Animal Husbandry Management

Unit 3: Animal Health and Welfare

Unit 7: Biological Principles

Unit 10: Anatomy and Physiology

Unit 18: Animal Nursing.

Essential requirements

Learners need access to laboratory equipment such as microscopes, and examples of diagnostic techniques, as well as appropriate up-to-date literature and journals. Access to veterinary equipment (whether in use or not) is also essential to introduce learners to the different methods used in first aid and veterinary pharmacology.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit.

Employer engagement and vocational contexts

Delivery of this unit would benefit from guest speakers from the veterinary and pharmacological sector who could discuss the analysis of results from diagnostics, the role of the immune system and potential disruption of the natural immunity, and demonstrate some common first aid techniques used on animals in 'real-life' situations.

Visits to veterinary surgeries and laboratories involved with vaccinations and analysing diagnostic tests could also be beneficial.

This unit could be run in conjunction with *Unit 18: Animal nursing*, as the units complement each other very well and cover similar subjects in different contexts.

Unit 16: Management of Animal Collections

Unit code: J/503/1687

Level: 5

Credit value: 15

Aim

This unit aims to enable learners to gain an understanding of how animal collections are managed through the study of a range of animal centres.

Unit abstract

Learners will develop the skills and understanding required to effectively manage an animal collection in a supervisory or managerial role. Learners will explore the legislative aspects of keeping, housing and moving animals within a collection as well as the husbandry, nutrition and health management of animals held within specified collections.

The unit covers the importance of visitors, their requirements and behaviour, enabling learners to understand management of a collection which is appealing to visitors and financially viable.

The need to manage a collection which complies with animal welfare and health and safety legislation will be researched as well as the performance of specified animal collections and the need for effective management, marketing and promotion of these collections.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the management of a range of animal collections

2 Understand the husbandry needs of animals within a collection

3 Understand the commercial market for an animal collection

4 Understand customer care and visitor management in an animal collection.

Unit content

1 **Understand the management of a range of animal collections**

Staffing: requirements; hierarchy and authority; roles and responsibilities; knowledge and skills

Responsibilities: health and safety; legal in relation to employees, public and animals

S*trategic planning*: aims and objectives; importance of financial forecasting; market research; identification of human and physical resource requirements; status (not-for-profit, charity, public company, private company)

2 **Understand the husbandry needs of animals within a collection**

Key legalities: legislation relating to keeping, housing and movement of given animal collections; management implications and considerations

Accommodation needs: housing; enrichment; environment; safety and security; health and safety considerations; consideration of natural behaviours

Routine care: nutrition, health management; disease prevention, hygiene, legal considerations; compliance with animal welfare standards

3 **Understand the commercial market for an animal collection**

Markets: local; national; European; international

Competition: local; national; relative strengths and weaknesses

Marketing strategy: promotion; advertising; image; reputation; media

4 **Understand customer care and visitor management in an animal collection**

Customer care: client requirements; advice and guidance; complaints procedure; appropriate communication methods; methods of monitoring and evaluating customer satisfaction

Visitor management; visitor behaviour; routine and emergency situation management, facilities, methods of monitoring and evaluating visitor behaviour

Health and safety: ethical and legal responsibilities; health and safety policies and procedures; Health and Safety at Work Act 1974, general and specific risk assessment; centre policies and procedures

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the management of a range of animal collections	1.1 discuss the staffing requirements of given animal collections 1.2 examine the roles of staff in given animal collections 1.3 explain the need for strategic planning in the management of animal collections 1.4 discuss the responsibilities of running an animal collection on a day-to-day basis
LO2 Understand the husbandry needs of animals within a collection	2.1 explain the key legalities relating to the keeping, handling and movement of different animal species 2.2 evaluate the accommodation requirements of animals within a given animal collection 2.3 discuss the routine day-to-day husbandry of animals within a given animal collection
LO3 Understand the commercial market for an animal collection	3.1 discuss the suitability of the visitor catchment area 3.2 examine local competition for visitors to a given animal collection 3.3 assess whether the animal collection is a feasible business 3.4 critically assess methods of marketing the animal collection 3.5 justify recommended improvements to the visitor attractions
LO4 Understand customer care and visitor management in an animal collection	4.1 analyse the effectiveness of the animal collection in meeting customer needs 4.2 explain typical visitor behaviour at animal collections 4.3 summarise key health and safety requirements for a given animal collection

Guidance

Links

This unit links with *Unit 2: Animal Husbandry Management*, *Unit 3: Animal Health and Welfare*, *Unit 15: Principles of Animal Health* and *Unit 20: Exotics and the Pet Trade*.

Essential requirements

Learners must be given the opportunity to visit a range of animal collections, so they can compare various aspects of animal husbandry, collection management, health and safety and organisational structure. The collections must be different ie zoo, farm park, aviaries, aquarium etc. If centres have their own animal collections, these can also be used to support delivery but learners must still have access to a professional animal collections.

The underpinning topics of business management and marketing should be taught theoretically but, wherever possible, a hands-on approach should be adopted, so learners can appreciate all aspects of the management of animal collections.

Learners must have access to relevant books, journals and periodicals to develop academic, vocational and independent study skills.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit.

Employer engagement and vocational contexts

Employers could be identified to help tutors in the development of the programme of learning through the provision of guest speakers or in the design of assessment activities.

Learner involvement in an animal collection will help their development of management and work-based practices.

Unit 17: Fish, Game and Wildlife Management

Unit code: Y/503/1578

Level: 4

Credit value: 15

Aim

This unit will develop learners understanding of the range of wildlife resources that are managed and exploited in Britain and the systems and dominant practices used. Learners will develop their understanding of wildlife resource management and plan the management of fish, game and wildlife to meet animal welfare and objectives.

Unit abstract

In this unit learners will develop an understanding of the ecology of species that are managed for exploitation, primarily as sporting quarry and wild food produce. They will research the commercial exploitation of these wild animal species and plan for their long-term management. Learners will investigate harvesting strategies with respect to population dynamics and sustainable yields. The unit will enable learners to consider the economics and ethics of wildlife management and exploitation.

Learners will also develop the skills required to plan wildlife management within the present economic and legislative frameworks and discuss these plans, in a knowledgeable manner, with practitioners in the field.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the management of exploited wildlife species

2 Understand the ecology of exploited wildlife species

3 Be able to plan the management of a fish, game or wildlife resource

4 Understand harvesting strategies for the long-term economic exploitation of a species.

Unit content

1 **Understand the management of exploited wildlife species**

Exploited and managed species: game and coarse fish; wild and released gamebirds; wildfowl; deer; pest and predator species eg grey squirrels, foxes, rabbits, rodents, corvids, raptors, mustelids

Habitat requirements: requirements for breeding and reproduction; shelter and feeding at different stages of life cycle

Economic potential: direct income; by-products; indirect income; market analysis; potential scale of damage caused by pest and predator species

2 **Understand the ecology of exploited wildlife species**

Autecology: population dynamics; census techniques; stock assessment methods; feeding behaviour; breeding behaviour; territoriality; habitat requirements; impact of disease, parasites and predators

3 **Be able to plan the management of a fish, game or wildlife resource**

Management: breeding; rearing; culling; control of predation; habitat management, habitat creation; stocking densities; timespans; legal requirements; codes of practice; welfare issues; management objectives; marketing of product/service and any by-product; income and expenditure associated with management

4 **Understand harvesting strategies for the long-term economic exploitation of a species**

Harvesting strategies: times of year; selection of stock; gaining a good return from the harvest; culling methods; relevant legislation eg The Wildlife and Countryside Act 1981, Firearms Act, The Wild Game Meat (Hygiene and Inspection) Regulations 1995, Animal Welfare Act 2006, Deer Act 1991, Salmon and Freshwater Fisheries Act 1975; codes of practice; health and safety; animal welfare; computer software; modelling methods

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the management of exploited wildlife species	1.1 evaluate the management of exploited wildlife specifies habitats 1.2 explain the economic potential of exploited wildlife species 1.3 examine how other species can affect the productivity of given exploited wildlife species
LO2 Understand the ecology of exploited wildlife species	2.1 explain times of year for breeding, rearing and/or culling wildlife species 2.2 discuss hygiene requirements and ailments of each species 2.3 examine habitat requirements of a chosen species 2.4 evaluate methods of census and cull ratio
LO3 Be able to plan the management of a fish, game or wildlife resource	3.1 plan breeding and rearing relevant to a chosen species 3.2 explain the legal requirements for management of the chosen species 3.3 assess habitat requirements for the chosen species
LO4 Understand harvesting strategies for the long-term economic exploitation of a species	4.1 explain the concept of maximum sustainable yield in relation to the management/exploitation of wildlife species 4.2 discuss how cull ratios have a direct effect on the population dynamics of exploited species 4.3 assess the potential market for animal products

Guidance

Links

This unit introduces learners to the fish, game and wildlife management sector and therefore links with more general units in this qualification list such as *Unit 2: Animal Husbandry Management*, *Unit 3: Animal Health and Welfare*, *Unit 4: Animal Nutrition* and *Unit 11: Animal Behaviour*.

Essential requirements

Learners need access to relevant literature and web pages. Field visit sites must be used to support delivery. Tutors must have a good understanding of local fish, game and wildlife resources.

Employer engagement and vocational contexts

Employer links could support delivery and assessment of this unit. Employers could help, for example, with the planning of programmes of learning, or provision of visits, guest speakers and mentors. They could also help in the design and facilitation of assessment activities.

Learners could, for example, meet with employers from an agent from a sporting estate and/or fishery to research the types of marketing used in the game, wildlife and fisheries sector.

Learners would benefit from visiting sporting estates and input from a range of guest speakers. Learners could be encouraged to become student members of relevant professional organisations.

Unit 18: Animal Nursing

Unit code: T/503/1720

Level: 4

Credit value: 15

Aim

This unit aims to develop learners' understanding of the role of a nurse within a veterinary practice. The unit examines the ethical and legal requirements relevant to veterinary staff and the services they provide. It also explores current veterinary techniques used and the treatment of animal patients, as well as current surgical practice.

Unit abstract

Veterinary nursing is a rewarding and intense career that involves a knowledge and understanding of a range of animals and their medical needs. This unit explores the animal nursing techniques needed to deliver basic first aid and medication to animals and anaesthesia and care of the patient pre- and post-surgery. Learners will research ethics and legal matters, and other influences that form a crucial part of the animal nursing profession, including limitations of the veterinary role, legislation governing the profession and the role of the nurse within a veterinary practice.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand ethics and legalities surrounding the veterinary profession

2 Understand application of practical animal nursing skills and medication to a range of animals

3 Understand specialist veterinary nursing techniques

4 Understand current anaesthetic and surgical care for animals.

Unit content

1 **Understand ethics and legalities surrounding the veterinary profession**

Legislation, legal obligations and ethical conduct: Veterinary Surgeons Act 1966; confidentiality and the Data Protection legislation; animal welfare; professional ethics; Veterinary Nurses' Guide to Professional Conduct (RCVS); Animal Welfare Act 2006; Protection of Animals (Anaesthetics) Acts 1954-1964; Animals (Scientific Procedures) Act 1986; Health and Safety at Work Act 1974; Environmental Protection Act 1990 (handling of clinical waste), plus amendment of 2007/08 (disposal of waste); Dangerous Dogs Act 1991 (plus Dangerous Dogs (Amendment) Act 1997); Medicines Act 1968; Misuse of Drugs Act 1971 (to include the Misuse of Drugs Regulations 2001); influence on veterinary profession of local island regulations/law eg The Channel Islands, The Isle of Man

Limits to legal treatment: Schedule 3 of the Veterinary Surgeons Act 1966; emergency animal first aid; role of the veterinary nurse in the veterinary surgery; administration of anaesthesia; acts of veterinary surgery

Veterinary Nursing Register: uses; importance; maintaining body eg the RCVS

Veterinary surgery education initiatives: dietician; pet and socialisation clubs; preventative healthcare; behaviour studies; bereavement counsellor; role; purpose

Animal euthanasia: the process; circumstances (illness, aggression, breeding, age); grief counselling; support groups

2 **Understand application of practical animal nursing skills and medication to a range of animals**

Handling, restraint and examination of injured animals: restraint; equipment that could be used to safely restrain animals in different situations; transport; prioritising the casualty over others; initial examination; case history; frequency and types of observation

Nursing care: emergency assessment first aid; road traffic collisions; shock; trauma; artificial respiration; breathing difficulties; dehydration; unconsciousness; deep wounds; punctures and bleeding (internal and external); application of dressings and bandages; chest wounds; abdominal injuries; head injuries; burns and scalds; poisoning; fractures; seizures; vomiting and diarrhoea; heat stroke

Drug groups and effects: controlled drugs regulations; dosage and frequency; anabolics; analgesics; antibacterials; antibiotics; anticoagulants; anticonvulsants; antihistamine; antiseptic; antisera; diuretics; ectoparasiticides; anthelmintics; fungicides; hormones; laxatives; oestrus control; sedatives; tranquillisers; vaccines; vasoactive drugs; anti-inflammatory; hypotensive effect; synergistic effect of certain drugs

3 **Understand specialist veterinary nursing techniques**

Equipment and techniques: emergency resuscitation kit; oxygen supply; intravenous infusion; urinary catheterisation; thermometer; stethoscope; gloving, gowning and draping; preparation of instrument trolley and instruments; sutures and needles; ECG; chest drain; drugs; heat pad; insulation; isolation; lab-microhaematocrit centrifuge; PCV measurements; spectrophotometer; plasma protein measurement; urine specific gravity measurement

Wildlife nursing: handling and management; distress; welfare considerations; feeding; re-release or retention in captivity; the risks of zoonoses; carriers and transmitters; rehabilitation; legalities

Alternative animal nursing: homeopathic treatment; philosophy; method; use as a treatment; use in prevention of disease; relationship between homeopathy and conventional medicine and diagnosis; acupuncture; herbalism; osteopathy; chiropractic; magnetic; vibratory; laser; ultrasonic and electrical therapies

Current technologies and specialist services: radiography – positioning; contrast media; fluoroscopy; ultrasound; blood machines; endoscopy

4 **Understand current anaesthetic and surgical care for animals**

Pre-operative care: pre-operative preparation and care*;* pre-assessment of patient; consent form; bathing; clipping; skin preparation; withholding of food for certain species; enemata/purgatives; medication; positioning; comfort; TLC; importance of the Nursing Care Plan (including examples of models used in veterinary nursing)

Post-operative care: recognising signs of pain, its management and analgesia; care of intravenous lines; drains and catheters; monitoring of pulse; temperature and respiration; mucous membranes; fluid output (including urinary) and input; diet and feeding techniques; activity; bandages; dressings and casts; complications (causes and care); implementation of the nursing care plan

Fluid treatment: fluid requirements; replacement and maintenance; dehydration; shock; fluid and electrolyte disorders; oedema fluid administration; type of fluid; amount and route of administration; intravenous administration; over transfusion (to include ascites); types of fluid; crystalloid fluids; colloid fluids; plasma and blood

Convalescence nutrition: balanced diet; digestibility and palatability; water content; energy requirements; dietary sensitivity; altered nutritional needs; nutritional support; intravenous and enteral feeding; suitable diet; obesity management; gastrointestinal disease; pancreatic disease; liver disease; diabetes mellitus; renal failure; skin disease; cardiac disease; specialised requirements for exotics

Anaesthetic technique and surgical techniques: role of scrub nurse; techniques for administering anaesthetic by inhalation and intravenous anaesthesia; flow rates and monitoring devices; drugs used in conjunction with anaesthesia; pre-medication and sedation; monitoring of the patient

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand ethics and legalities surrounding the veterinary profession	1.1 examine the legal obligations and ethical conduct of veterinary staff 1.2 discuss the legal limits of the treatment of animals by persons other than veterinary surgeons 1.3 explain the application of animal euthanasia 1.4 evaluate the effectiveness of veterinary animal welfare education initiatives
LO2 Understand application of practical animal nursing skills and medication to a range of animals	2.1 explain how a range of injured animals should be handled correctly and safely 2.2 compare animal examination techniques 2.3 examine care suitable for a range of animal injury and ill health conditions 2.4 analyse the major groups of drugs, their legal categories and effects on animals
LO3 Understand specialist veterinary nursing techniques	3.1 discuss the equipment and techniques used when nursing a range of animals 3.2 describe the specialist requirements for the nursing and rehabilitation of wildlife 3.3 evaluate alternative animal nursing techniques 3.4 evaluate the technology and specialist services available for use in a veterinary practice
LO4 Understand current anaesthetic and surgical care for animals	4.1 explain appropriate pre-operative care for a patient 4.2 explain appropriate post-operative care for a patient 4.3 discuss the use of fluid therapy and the nutrition of convalescing animals 4.4 examine current surgical and anaesthetic techniques

Guidance

Links

This unit introduces learners to animal nursing; and therefore links to the following units in the qualification:

Unit 2: Animal Husbandry Management

Unit 10: Anatomy and Physiology

Unit 13: Animal Law and Ethics

Unit 15: Principles of Animal Health.

Essential requirements

Learners will need access to the internet and up-to-date animal nursing and veterinary textbooks and journals to carry out research needed. Links must be established with veterinary practices so learners can observe usual veterinary practice and even carry out a period of work experience (with special attention to legal/ethical restrictions).

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit.

Employer engagement and vocational contexts

Delivery of this unit would benefit from a range of expert speakers and external visits, and where possible, a period of learner work experience to gain valuable insight into the daily tasks of a veterinary nurse. Visits to specialist centres such as veterinary universities, referral centres and veterinary ophthalmic or orthapaedic specialist centres would benefit learners in terms of gaining an alternative insight into daily routines.

Learners should be encouraged to take a practical approach to putting the subjects, methods and techniques they have learned into practice (except where the law does not permit). Spare blood or faecal samples from local veterinary practices should be used rather than bringing animals into the centre for invasive procedures.

Learners should be given a balanced approach to alternative and innovative methods used in veterinary nusring. This could be delivered by a veterinary professional (or a representative from a company providing medication and equipment to the veterinary industry) – care should be used if not delivered by a Veterinary Professional.

Unit 19 Production Animal Management

Unit code: A/503/1721

Level: 5

Credit value: 15

Aim

This unit aims to develop learner understanding of the husbandry of production livestock to provide insight into a different sector of the animal management industry. Learners will develop an understanding of the major systems of livestock production and an appreciation of the associated husbandry needs.

Unit abstract

In this unit the learners will develop theoretical and practical understanding of production animal management in relation to a broad range of intensive and extensive systems.

Learners will research different types of production animal management and performance to develop understanding of the modern-day production animal management and the various, pressures, trends and issues it faces.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand intensive and extensive production systems

2 Understand a range of production animal housing and handling systems

3 Understand the management and breeding of a group of commercial animals

4 Understand the commercial pressures affecting the production of livestock.

Unit content

1 **Understand intensive and extensive production systems**

Intensive and extensive production: types of systems and definitions; reasons for choice (eg locality, subsidies, personal philosophy, quality of life, business driven, long-term sustainability); targets for production

Comparison of two systems: conform to current codes of practice; public attitudes and pressures (eg Farm Animal Welfare Council (FAWC), pollution from smell, noise); environmental impact; animal health measures; physical and financial performance (eg inputs, outputs, variable and fixed costs, unit costs)

2 **Understand a range of production animal housing and handling systems**

Differing housing needs: related to animal type (eg size, sex, age, growth pattern, temperature requirement, space allowance); conform to welfare codes; locality (eg weather patterns, seasons, tradition)

Housing design considerations: needs of the animal; conform to legislation and current Welfare Codes, space requirements); site and topography; suitability of building materials (eg plastic, metal, wood); ventilation requirements (eg natural, temperature controlled, thermal efficiency); bedding requirements and waste management (eg type of litter, gases such as ammonia, waste removal and machinery access); feed and water delivery (eg machinery access, adequate space, number and type of water troughs, automatic and self-feed systems); breeding management (eg need for loafing areas, stalls for artificial insemination, location); lighting; energy efficiency; aesthetic value

Hygiene and health: effects of good and bad hygiene on animal performance; methods of implementation (eg biosecurity, health plan, quarantine, depopulation, disinfection and cleaning, staff and training, codes of practice); record keeping

Animal behaviour: herd instinct; maternal instinct with young; animal senses (eg vision, hearing, smell); response to fright (eg when spooked, noise, electric fence); handling and moving methods; sex of animal (eg aggression, castration, entire, season of year)

Handling systems: materials; design layout and types according to animal management (eg electronic systems, temporary); waste removal; safety considerations for animals and staff; legislation

3 **Understand the management and breeding of a group of commercial animals**

Good husbandry practice: stockmanship (eg signs of health, animal behaviour, handling, body condition and diet, dung); conform to current welfare codes

Management of commercial animals and young: fertility management (eg heat cycles and animal behaviour, heat detection, management of sire, pregnancy diagnosis (PD) methods); managing gestation (eg body condition, diet; pre- and post-parturition management (eg transition diet, lactation, colostrum, fostering, stock tasks, care of young); weaning; heifer/young stock-rearing; growth rates; management for maximum/minimum efficiency (eg finishing diets, store periods, high/low input and outputs)

Methods of selecting breeding stock: breeding values (eg profit index (PIN), profitable lifetime index (PLI), predicted transmitting ability (PTA), estimated breeding values (EBVs)); phenotype selection of male and female characteristics (eg linear assessment, boar selection relative to a system, production targets)

Evaluate traits selected for: performance recording and analysis (eg fertility, numbers born, growth rates relative to system, milk yield and quality); physical assessment (eg locomotion, body-length, size, stance, udder, testicles); aids to traits selected (eg scanning for muscle, breed society assessment); breed showing; market assessment and financial analysis (eg slaughter weights and grades, time taken to finish)

Methods of artificial control: mating management (eg intra-vaginal devices (PRIDS or similar), hormonal injections, raddles, artificial insemination, embryo transfer (ET), cloning, current techniques); inducing birth

4 **Understand the commercial pressures affecting the production of livestock**

Supply and demand affecting choice of stock: purchase price (eg market, home-reared, breeding company, on-farm); season

Consumer pressures: current issues (eg local, regional, healthy eating, religious, vegetarian); environmentally friendly (eg outdoor-reared, free range, intensive and extensive); health scares relating to subsidies; welfare; slaughter management

Law regulating transport, movement and handling of livestock: current relevant legislation (national and European); welfare codes; record keeping; staff training; relevant bodies eg Health and Safety Executive (HSE)

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**		Assessment criteria for pass **The learner can:**	
LO1	Understand intensive and extensive production systems	1.1	critically review the management of the main intensive animal production systems in the UK
		1.2	compare two production systems from an animal welfare perspective
		1.3	recommend improvements to a selected animal production system
		1.4	justify recommended improvements to a selected animal production system
LO2	Understand a range of production animal housing and handling systems	2.1	compare housing needs of a range of livestock
		2.2	examine factors that need to be taken into account when designing animal housing
		2.3	explain the need for a stringent hygiene code
		2.4	assess animal behaviour to assist in the movement of stock causing minimal stress
		2.5	compare characteristics of handling systems and designs
LO3	Understand the management and breeding of a group of commercial animals	3.1	examine good husbandry practices when managing a range of commercial animals
		3.2	explain the appropriate management of commercial animals and their young
		3.3	assess methods used for breeding stock selection
		3.4	evaluate the selection of important traits when breeding
		3.5	review the effectiveness of methods of artificial control of reproduction which are used in the agricultural industry

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO4 Understand the commercial pressures affecting the production of livestock	4.1 explain supply and demand relationships affecting choice of commercial stock 4.2 review current consumer pressures relating to welfare and husbandry issues 4.3 examine the influence of consumer pressure relating to animal welfare and husbandry issues on industry practice 4.4 review law regarding livestock transportation/movement and handling 4.5 summarise relevant health and safety legislation affecting production of livestock

Guidance

Links

In this unit learners have the opportunity to observe and be involved with a broad range of animal production systems and as such, the unit links with all units such as *Unit 2: Animal Husbandry Management*, *Unit 3: Animal Health and Welfare* and *Unit 4: Animal Nutrition*.

Essential requirements

For this unit it is essential that a broad selection of animal production systems is available within reach of the centre. There must be a minimum of two intensive and two extensive systems with a range of animal types. Where this is not possible, a suitable visit programme must be built into the course to give the learners the opportunity to experience different production systems. Learners must also have sufficient time to carry out first-hand observation, research and analysis of their chosen animal production system.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit. Learners must be equipped with the relevant personal protective equipment (PPE) and trained in the safety and hygiene requirements for working closely with animals.

Employer engagement and vocational contexts

Links with, and access to, local farms and animal production facilities is desirable including markets, slaughter houses and breeding centres.

Where farms are used for visits, further study or any practical experience the farmer/manager could allow relevant information to be made available to learners where necessary.

Learners could make use of relevant journals and magazines that reflect current thinking and trends. It would also be useful for them to meet with, and observe others engaged with, the industry, such as feed technologists, nutritionists, inseminators, vets and contractors such as those involved with scanning.

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Unit 20: Exotics and the Pet Trade

Unit code: F/503/1722

Level: 4

Credit value: 15

Aim

This unit aims to develop learner understanding of the range of exotic species available through the pet trade. Learners will research comparative biology and husbandry of commonly encountered exotic groups and review wider issues of conservation in relation to the exotic pet trade.

Unit abstract

The market for exotic pets has increased in recent years with a greater variety of exotic species seen in the UK. This unit introduces learners to the wide range of available exotic pets. Learners will increase their understanding of the comparative biology of the different groups of exotic species, in relation to vertebrate class, and develop the knowledge and skills needed to manage a wide range of exotic species at a supervisory level.

The unit provides a focus on the global and economic importance of the exotic pet trade and the implications of this for conservation. Learners will explore the ethical sourcing and management of exotic species, the work of international animal welfare organisations and the importance, and impact, of current legislation in relation to exotic animal species.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the comparative biology of a range of captive exotic animals

2 Understand the comparative husbandry of a range of captive exotic animals

3 Understand the economic significance and implications of local and global trade in exotic animals

4 Be able to review wider issues of conservation in relation to the exotic pet trade.

Unit content

1 **Understand the comparative biology of a range of captive exotic animals**

Physiology: comparative physiology of specified exotics from each vertebrate class (mammals, birds, reptiles, amphibians and fish); representative species

Nutrition and dietary requirements: comparative nutritional requirements of specified species from each vertebrate class

Reproduction: comparative reproductive biology and strategies of specified exotics from each vertebrate class

Behaviour: comparative captive behaviour of specified exotics from each vertebrate class

2 **Understand the comparative husbandry of range of captive exotic animals**

Housing design: comparative housing designs for a range of captive exotics from each vertebrate class (mammals, birds, reptiles, amphibians and fish); enrichment; duty of care; five needs

Food and feeding regimes: comparison of provision, presentation and feeding regimes for a range of captive exotics from each vertebrate class

Breeding regimes: comparative breeding regimes for a range of captive exotics from each vertebrate class

Captive behaviour: comparable behaviour of exotic species from each vertebrate class; captive and natural behaviour; duty of care

3 Understand the economic significance and implications of local and global trade in exotic animals

Global trade: sources of live exotics; significance of the global trade in live exotics

Supply and demand: pressure of supply and demand on the distribution chain of live exotic species; import; export; wild populations; captive breeding; retail sector

Retail outlets: shift from traditional pet species to exotic species; significance of shift; implications for retail outlets

Implications for welfare and veterinary care: implications for welfare organisations and veterinary care in the change of emphasis from traditional pet animals to exotic species

4 **Be able to review wider issues of conservation in relation to the exotic pet trade**

Conservation and public opinion: conservation movements and strategies for exotic animals; public opinion in relation to the trade in live exotic species

International welfare: legislation specific to exotic species, implications and effectiveness of legislation in controlling the trade in specified exotic groups; role of international welfare organisations

Captive breeding: significance and limitations of captive breeding as a conservation measure

Global and local conservation: global and local conservation strategies, role of the individual within local and global conservation

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the comparative biology of a range of captive exotic animals	1.1 examine the physiology of specified exotics from each vertebrate class citing representative species 1.2 compare the nutritional and dietary requirements of specified exotics from each vertebrate class 1.3 compare the reproduction of specified exotics from each vertebrate class 1.4 compare aspects of the captive behaviour of specified exotics from each vertebrate class
LO2 Understand the comparative husbandry of a range of captive exotic animals	2.1 evaluate housing design for a range of captive exotics from each vertebrate class 2.2 compare the provision of food and feeding regimes for a range of captive exotics 2.3 evaluate breeding regimes for a range of captive exotics
LO3 Understand the economic significance and implications of local and global trade in exotic animals	3.1 examine the sources and significance of the global trade in live exotics 3.2 discuss the relative pressure of supply and demand on live exotic trade and the distribution chain 3.3 explain the implications for retail outlets in the change of demand from traditional pet animals to exotics species 3.4 discuss the implications for welfare organisations and veterinary care of the change of emphasis from traditional pet animals to exotics species
LO4 Be able to review wider issues of conservation in relation to the exotic pet trade	4.1 review the role of the conservation movement and public opinion in relation to international live animal trade 4.2 review the role of international welfare organisations and legislative controls on the trade in specified exotic groups 4.3 review the significance and limitations of captive breeding programmes as a conservation measure 4.4 discuss the role of the individual in global and local conservation of exotic species

Guidance

Links

This unit is closely linked with *Unit 2: Animal Husbandry Management*, *Unit 16: Management of Animal Collections*, *Unit 21: Aquatics and Fishkeeping* and *Unit 24: Natural History of Exotic Mammals*.

Essential requirements

It is essential that the theoretical knowledge relating to the management and husbandry of captive exotic species is supported and underpinned with regular access to a wide range of species from each vertebrate class (mammals, birds, reptiles, amphibians and fish). If this is not possible within the centre, regular visits to establishments housing captive exotics are essential. Whichever option is selected, learners must have regular access to a variety of exotic animal species and associated husbandry equipment to develop their practical confidence and competence.

They will also need access to articles, journals and periodicals to support and develop their research and independent study skills.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit. Learners must be equipped with the relevant personal protective equipment (PPE) and trained in the safety and hygiene requirements for working closely with animals.

Employer engagement and vocational contexts

Employer engagement, and the use of expert speakers, could enhance the delivery of this unit, enabling learners to gain information and experiences from professionals within the field. Guest speakers from conservation and welfare organisations could be approached to give talks about their work and the impact and effectiveness of conservation efforts to preserve wild exotic populations. Veterinary surgeons and exotic experts could enhance the learning experience in relation to the physiology of exotic animals and the associated husbandry.

Learners would benefit from visiting a range of animal collections housing a variety of exotic species, ideally to carry out practical husbandry tasks for species they do not have regular access to. Learners would also benefit from membership to exotic animal welfare, professional and conservation organisations.

Unit 21: Aquatics and Fishkeeping

Unit code: J/503/1723

Level: 5

Credit value: 15

Aim

This unit aims to develop learner understanding of fish biology, aquatic invertebrates and aquatic management, as well as their practical skills in maintaining of aquatic species in appropriate conditions.

Unit abstract

In this unit learners will explore the factors that an aquarium employee or ornamental fish farmer need to understand. The unit focuses on the work involved at an aquarium, aquatic centre, specialist pet centre or similar, and the ideas in this unit are major considerations for this area of the industry. Certain aquaria around the world use these skills to support species on the verge of collapse and, as such, have developed in-depth breeding programmes. Examples of the skills developed in this unit can be seen around the world for example an aquarium in California has been able to establish Scorpion fish in captivity, a species notoriously difficult to breed, by applying a knowledge of water requirements and health management strategies.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the taxonomy and biology of ornamental aquatic species

2 Be able to establish, monitor and interpret freshwater and marine community aquaria and ponds

3 Understand appropriate aquatic health management strategies

4 Understand procedures and practices relating to the acquisition, transportation, holding and supply of aquatic organisms.

Unit content

1 **Understand the taxonomy and biology of ornamental aquatic species**

Origins: evolution; taxonomy; nomenclature; classification; geographic origins of species and occurrence; water types; habitats

External anatomy: morphology; skin; mucous; scales; fins; lateral line; eyes; mouth eg jaw structure; species – specific external features eg catfish barbels

Internal anatomy: systems – form and function; gastro-intestinal tract and feeding style; gills and adaptations for air breathing; liver; spleen; kidneys; circulatory system; skeletal/muscular system; nervous system

2 **Be able to establish, monitor and interpret freshwater and marine community aquaria and ponds**

Establishment: livestock requirements eg suitability as pets, species compatibility, feeding requirements, space and habitat provision; water quality eg ammonia, chlorine, nitrite, nitrate, phosphate, pH, temperature, salinity, conductivity, general hardness, total hardness, buffering, hydrogen sulphide, dissolved gases; filtration eg filter types and suitability, biological filtration, chemical filtration, mechanical filtration

Monitoring: water quality checks; chemical test kits; electronic systems eg aqua control systems, monitoring software, WiFi enabled tanks, tank cameras

Maintenance: maintenance regimes eg sterilisation, UV sterilisation, carbon dioxide systems, foam fractionisation, reverse osmosis, ozone generators

3 **Understand appropriate aquatic health management strategies**

Health monitoring: techniques; observation; signs of health; information sources; diagnostic techniques

Health maintenance: good husbandry; hygiene; feeding; protocols; stress avoidance/relief; prophylaxis; isolation; quarantine; first aid techniques

Common disease conditions: transmission; causal agents; aetiology; signs; effects; prognosis; prevention and treatment; trauma conditions, notifiable and zoonotic disease implications, administration of medicaments, legislation, euthanasia

4 **Understand procedures and practices relating to the acquisition, transportation, holding and supply of aquatic organisms**

Sources of livestock: wild caught; farmed; capture methods; controls; sustainable harvesting

Supply chains: catchers; farmers; breeders; exporters; importers; consolidators; wholesalers; retailers, economics

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Transport: requirements eg IATA – LAR container requirements; WATO; Veterinary Checks Directive; management eg packing, handling, loading, administration, consignee, consignor and airline responsibilities, health and safety requirements

Legislation: CITES; CBD; WACA; Import of Live Fish Act; fish health legislation

Welfare: principles; environmental appraisal; welfare issues; welfare legislation; codes of conduct and guidelines; environmental health/licensing inspections

Conservation: issues; environmental quality; vulnerability and threats; MAC; conservation organisations; the Ornamental Aquatic Trade Association (OATA)

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the taxonomy and biology of ornamental aquatic species	1.1 examine the comparative evolution and classification of fish and aquatic invertebrates 1.2 explain how the anatomy and physiology of fish is adapted to cope with life in aquatic environments 1.3 compare various breeding strategies to determine their advantages and disadvantages 1.4 recommend aquatic breeding strategy for a given scenario
LO2 Be able to establish, monitor and interpret freshwater and marine community aquaria and ponds	2.1 evaluate the suitability of fish and aquatic invertebrates in relation to the dynamics of given community aquaria 2.2 maintain water quality parameters in aquaria and ponds correctly over a given period 2.3 examine the advantages and disadvantages of the range of aquatic filtration options
LO3 Understand appropriate aquatic health management strategies	3.1 explain the relationship between correct husbandry and fish health 3.2 review the causes and effects of common fish diseases, their prevention and treatment 3.3 examine the significance of zoonotic and notifiable conditions and outbreak management 3.4 recommend appropriate first aid treatments for a range of trauma conditions and their subsequent management techniques
LO4 Understand procedures and practices relating to the acquisition, transportation, holding and supply of aquatic organisms	4.1 review sources of supply in relation to fish/aquatic invertebrate health, welfare, conservation, sustainability, economics and legislation 4.2 explain transport requirements in relation to fish health, welfare, economics and legislation 4.3 evaluate natural aquatic environments in relation to quality, vulnerability, threats and conservation management 4.4 discuss the role of the retailer in the promotion of responsible fish ownership

Guidance

Links

This unit links with the following units within this qualification:

Unit 2: Animal Husbandry Management

Unit 3: Animal Health and Welfare

Unit 6: Work-based Experience

Unit 10: Anatomy and Physiology

Unit 13: Animal Law and Ethics

Unit 16: Management of Animal Collections

Unit 18: Animal Nursing

Unit 33: Project Management for Land-based Industries.

Essential requirements

Sufficient library resources must be available to enable learners to achieve the unit, including a biological dictionary, a veterinary dictionary and a range of textbooks/media covering taxonomy, classification, fish anatomy and physiology, ecology, fish keeping, fish health, marine biology, pet trade, animal transportation, animal-related legislation, welfare and conservation.

Learners will also need access to equipment/consumables including tanks, filters, thermostats, heaters, substrate, plant material, water quality test kits, transportation carriers, dissection kits, and fish models.

Regular supervised access to a range of fish species for routine husbandry and management, and laboratory access, is essential and could be enabled by forming links with local aquaria or aquatics suppliers.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit.

Employer engagement and vocational contexts

Learners would benefit from having access to a suitable working environment. Often this can be achieved by establishing links with local businesses or charitable organisations who may benefit from taking on learners. Local aquaria and aquatic suppliers are a good source of information and are often keen to share their knowledge with students. Charitable organisations can provide guest speakers to give lectures and demonstrations.

Unit 22: Human Animal Interactions

Unit code: L/503/1741

Level: 5

Credit value: 15

Aim

The aim of this unit is to develop learner understanding of the historic and modern roles of animals in human societies and the range of socio-economic and cultural factors that have underpinned these changes. The unit is designed to encourage learners to research factors that influence human attitudes towards animals and the roles animals play in different human cultures.

Unit abstract

Understanding the role of animals for different human cultures can be vital to those working in the animal management industry. The significance and nature of the interactions between animals and human societies, both now and in the past, is considered in this unit alongside the global, societal and individual factors responsible for these relationships.

In addition, this unit will develop understanding of human psychology and require application of key concepts (eg social dominance theory) to the critical evaluation of individual and cultural attitudes to animals and their welfare.

It will cover companion, commercial, research and wild animals and learners will be equipped to produce considered responses to a range of husbandry and management challenges based on established research and moral and ethical considerations.

Learners will explore the moral, political, socio-economic and welfare issues brought about by the integration of animals into human societies are also considered together with the changing roles of animals in human cultures and the reasons for these changes. They will cover the roles of influential groups such as animal welfare organisations and governments.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand a range of factors related to individual and cultural attitudes to animals and their welfare

2 Understand a broad range of historic and modern animal roles in human society

3 Understand the significance of the human-animal bond

4 Understand issues arising from the integration of animals into human society.

Unit content

1 **Understand a range of factors related to individual and cultural attitudes to animals and their welfare**

Historical and modern perspectives: historic perspectives eg through accounts, paintings, documentaries, philosophical accounts and events synchronising with law formation; modern perspectives eg through surveys, documentaries, research, organisational statements; personal perspectives as a function of individual psychology (Belief in Animal Mind, Social Dominance)

Influential factors: tradition; religion and animal worship; mythology; socio-economic including trade and consumerism; science and technology; human rights; education; literature, film, television and the modern media; legislation

Global cultures and societies: the value and use of animals hunter-gatherer societies, tribal, nomadic, more economically developed societies; less economically developed countries; differing religious cultures

2 **Understand a broad range of historic and modern roles of animals in human society**

History of integration: early historical accounts of animals in society; the premise for integration in prehistoric and ancient societies and cultures; domestication

Historic roles: classification of roles and examples of the use of animals within these categories, including working roles eg entertainment and sport, agricultural products and food, companionship and status, roles in science, roles in therapy and assistance; roles in combat

Animals in today's human society: examples of the scope and scale of animal use/integration in developed countries eg North America, Europe, Australia and developing countries eg Africa, South East Asia, South America; consideration of the organisations and bodies involved, governmental and non-governmental eg World Wide Fund for Nature (WWF), Royal Society for the Prevention of Cruelty to Animals (RSPCA), Royal Society for the Protection of Birds (RSPB), Rare Breeds Survival Trust (RBST), DEFRA

Different cultures and societies: differences and similarities in the use of animals in hunter-gatherer societies; tribal societies; nomadic cultures; developed societies; developing countries; differing religious cultures

Socio-economic considerations: Trade tariffs and barriers; the role of WTO; consumerism and the conscientious consumer

3 **Understand the significance of the human-animal bond**

The psychological nature of relationship: social dominance orientation; belief in animal mind; models of attachment theory

Anomalous behaviours: hoarding; neglect and abuse; the 'link theory'

Benefits to humans: physical eg lower blood pressure, stress-reduction; psychological eg child development, role in educational settings, alleviating loneliness and social isolation,

Grieving in humans and animals: Evidence for analogous grieving processes; significance in a management context eg bereavement counselling for owners and appropriate husbandry for animals

4 **Understand issues arising from the integration of animals into human society**

Moral and ethical issues: animal status and entitlement to animal rights; the utilitarian value of interests with respect to animal use; modern moral philosophy in relation to animal rights and utilitarianism eg Narveson, Singer, Regan, Brophy, Linzey, Goodall, Barash and Midgley; human rights

Welfare issues: establish and illustrate a variety of welfare issues for each category of animal use; mutualististic or exploitative nature of HAI; species specific inconsistencies in welfare outcomes; views and mission statements of Government bodies, NGOs animal welfare organisations; views of organisations representing categories of use; public perception; collation of press articles and reports

Legal and political issues: overview of legislation relating to animals; legal rights; recent lobbies; causation of amendments; political agendas; impact of European Directives and international conventions; trade restrictions and requirements

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand a range of factors related to individual and cultural attitudes to animals and their welfare	1.1 evaluate historical and modern perceptions of animals within society 1.2 assess psychological, socio-economic and religious factors that influence human perceptions and attitudes towards animals on an individual and societal level 1.3 examine differing human attitudes to animals on a global basis
LO2 Understand a broad range of historic and modern animal roles in human society	2.1 discuss the history of the integration of animals with human society in the developed world 2.2 examine historic and modern roles of animals in the developed world 2.3 assess the roles of animals in different developing and developed societies
LO3 Understand the significance of the human-animal bond	3.1 assess the psychological factors that determine an individuals response to animals 3.2 discuss the development of anomalous behaviours and the validity of the link theory 3.3 evaluate the range of beneficial outcomes to man as a result of human animal interactions 3.4 analyse the significance of the grieving response in both animals and man
LO4 Understand issues arising from the integration of animals into human society	4.1 analyse key moral and ethical issues associated with the integration of animals into human society 4.2 evaluate animal welfare issues arising from the integration of animals with human society 4.3 analyse the legal and political issues arising from the integration of animals in human society 4.4 assess the impact of Government and Non-Governmental organisations on animal welfare in human society

Guidance

Links

This unit complements *Unit 13: Animal Law and Ethics* and provides the background knowledge for each of the specific animal husbandry/management units.

Essential requirements

To carry out research, learners will need access to a well-stocked library and access to the internet. The use of audio-visual materials, such as documentaries, debates and slides must be used. Learning would also be enhanced through accessing historical records and artwork, many of which are freely available online.

Employer engagement and vocational contexts

Learners would benefit from visits to local animal sanctuaries, RSPCA centres and organisations such as Rare Breed Trusts, and from relevant work experience placements to support the issues considered in this unit. Guest speakers would also enhance and contextualise the learning experience and introduce learners to a broad range of career opportunities available in this area. Analysing real life issues arising from integrating of animals with human society will give learners a more balanced and objective view of current practices in animal management.

Unit 23: Animal Adaptations

Unit code: R/503/1742

Level: 5

Credit value: 15

Aim

The aim of this unit is to give learners an overview of the trends in the evolution of the animal kingdom. It develops this by presenting an overview of how a range of animals have adapted to specific problems they have encountered within a range of differing environments.

Unit abstract

Animals have been able to occupy and thrive within a wide range of global environments from oceans to deserts. In order to survive in these environments an exceptional range of physiological, anatomical and biochemical adaptations has evolved. In this unit learners will gain an understanding of a range of specialist adaptations which reflect the enormous diversity of the animal kingdom.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand animal adaptations for obtaining and transporting oxygen within a range of habitats and conditions

2 Understand the feeding and metabolic adaptations of a range of animal species

3 Understand adaptations within the animal body related to habitats and conditions

4 Understand animal adaptations to a range of specific habitats and conditions.

Unit content

1 **Understand animal adaptations for obtaining and transporting oxygen within a range of habitats and conditions**

Adaptations: gas exchange surfaces, lungs, spiracles and gills (tuft, filament and lamellate); diffusion barriers; ventilation systems (concurrent, crosscurrent and countercurrent systems); respiratory control in aquatic, amphibious and terrestrial animals (including diving mammals); circulatory systems (including open and closed systems); single and dual circuits; portal systems; respiratory pigments and their properties (haemoglobins, myoglobins, heamerythrins and haemocyanins); response of oxygen dissociation curves to pH, temperature, partial pressure of carbon dioxide and organic modulators (2,3-diphosphoglycerate)

Habitats and conditions: aquatic; amphibious; terrestrial; diving mammals (pressure and oxygen availability); flight (metabolic demand and pressure)

2 **Understand the feeding and metabolic adaptations of a range of animal species**

Feeding adaptations: carnivores, herbivores (including hind gut fermentation and ruminants), omnivores and insectivores; mutualism and parasitism

Metabolic adaptations: fundamental principles of metabolic adaptation (including controlling protein action, synthesis, degradation and evolution); body size implications (eg temperature regulation, locomotion, metabolism), fuel sources for aerobic metabolism, aerobic metabolism in flying insects; strategies of avoidance, tolerance, conformance and regulation; thermal effect on membranes; freeze tolerance and intolerance; ectothermy and endothermy (partial, facultative, regional and inertial endothermy); thermogenesis (shivering and non-shivering); heat exchange with the environment (radiation, convection, evaporation, conduction); heat exchangers; insulation (eg fur, blubber); behavioural adaptations (eg huddling, posture, migration); heat storage (transient hyperthermia); evaporative cooling; torpor and diapauses in ectotherms; hypothermia, torpor and hibernation in endotherms; nervous and hormonal regulation of body temperature

3 **Understand adaptations within the animal body related to habitats and conditions**

Internal environments: marine osmoconformers, hyposmotic teleosts and marine tetrapods; osmotic adaptations to shoreline and esturine environments; osmotic adaptations in fresh water species (permeability, ion uptake, hyposmotic urine production); terrestrial osmotic adaptations, skins and cuticles, liquid and vapour uptake, respiratory water loss, production and excretion of waste products (including urine volume and concentration in a range of species including flatworms, arthropods and vertebrates); ureotelic and uricotelic organisms; significance of metabolic water; nervous and hormonal control if osmoregulation.

Habitats and conditions: hyperosmotic, hyposmotic and arid environments

4 **Understand animal adaptations to a range of specific habitats and conditions**

Adaptations: life history adaptations; r selection; K selection and A selection; biotic and abiotic factors; reproductive strategies; aestivation

Habitats and conditions: salt water; fresh water; depth; pressure; buoyancy (eg diving mammals and flight); arid; hot; cold; borrowing; nocturnal

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand animal adaptations for obtaining and transporting oxygen within a range of habitats and conditions	1.1 explain the gas exchange structures and mechanisms in a range of animals 1.2 examine oxygen transport mechanisms and oxygen dissociation curves 1.3 compare and contrast adaptations to the circulatory systems shown by a range of invertebrates and vertebrates 1.4 examine the adaptations to the respiratory and circulatory systems shown by diving mammals
LO2 Understand the feeding and metabolic adaptations of a range of animal species	2.1 review the effectiveness of methods of obtaining food within the animal kingdom 2.2 relate the feeding and metabolic requirements of animals to their structure and mode of life 2.3 relate the metabolic rate of a variety of animal species to environmental and physiological variables 2.4 explain the physiological and behavioural responses to heat and cold in animals
LO3 Understand adaptations within the animal body related to habitats and conditions	3.1 explain the processes of osmoregulation in marine and freshwater fish 3.2 examine the adaptations shown by marine, air-breathing vertebrates to water and salt regulation 3.3 review the adaptations to survival in dry environments 3.4 relate the excretory product and process to animal ecology
LO4 Understand animal adaptations to a range of specific habitats and conditions	4.1 evaluate the ecological constraints on animals 4.2 explain the measurement of abiotic factors 4.3 explain life history strategies shown by a given animal species 4.4 report on animal adaptations demonstrated within two habitats

Guidance

Links

This unit links with *Unit 10: Anatomy and Physiology* and *Unit 7: Biological Principles*.

Essential requirements

Learners must have access to appropriate literature including textbooks, academic journals and relevant web sites. They will also need access to appropriate testing equipment to measure abiotic factors.

Employer engagement and vocational contexts

Animal collections (private and public) can provide access to a wide range of species adapted to different environments. Links with government organisations responsible for conservation may give learners access to native species to study which might include costal regions, forestry, marsh, farmland and waterways. Non-Governmental Organisations involved in conservation may also provide valuable experience.

Butchers and abattoirs may be able to provide specimens to illustrate physiological and anatomical adaptations. Research laboratories, museums and universities could also provide access to preserved or live specimens for demonstration.

Unit 24: Natural History of Exotic Mammals

Unit code: Y/503/1743

Level: 5

Credit value: 15

Aim

This unit aims to develop learners understanding of the natural history of mammalian groups and individual significant species, their origins, adaptations, characteristics and behaviour in the wild, together with their present status and the viability of their survival.

Unit abstract

A study of mammals in their natural environment, as well as becoming more popular, has significantly enhanced our knowledge and understanding of wild animal species. Field research of mammalian adaptations, their distribution, demographics and pressures has benefits for both *in-situ* conservation and captive animal management. Knowledge gained in this unit will benefit learners seeking employment in related careers in the UK and abroad, such as zoo work, research or conservation.

The unit examines the natural history of mammalian groups and individual significant species, their origins, adaptations, characteristics and behaviour in the wild as well as examining the current pressures and threats to mammal groups and the conservation efforts both *in situ* and in captivity to preserve the long-term viability of mammal species.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the variations in the natural history of carnivores

2 Understand the natural history of non-carnivores

3 Understand the adaptations and status of aquatic mammals

4 Understand the specialisation of Chiroptera, monotremes and marsupials.

Unit content

1 **Understand the variations in the natural history of carnivores**

Evolution: classification; taxonomy; speciation; biogeography

Groups: Felidae; Canidae; Ursidae; Viverridae; Hyaenidae; Procyonidae; Mustelidae; individual species identification and differentiation

Natural history: distribution; demographics; habitat; lifestyle; territoriality; adaptations; characteristics and behaviour; communication; socio-biology; hunting techniques and prey species; reproductive strategies; interspecific and intraspecific competition

Conservation: population status; pressures; human conflict and prejudice; *in-situ* management strategies; *ex-situ* captive breeding evaluation; reintroduction potential; case studies; welfare and ethics

2 **Understand the natural history of non-carnivores**

Evolution: classification; taxonomy; speciation; biogeography

Groups: primates; lagomorphs and rodents; even and odd-toed ungulates; Proboscidae; individual species identification and differentiation

Natural history: distribution; demographics; habitat; lifestyle; migration; adaptations; characteristics and behaviour; communication; socio-biology; foraging and preferred flora; predation defence/avoidance; reproductive strategies; interspecific and intraspecific competition with wild and domestic stock

Conservation: population status; pressures; human conflict; *in situ* management strategies; *ex situ* captive breeding evaluation; reintroduction potential; case studies; welfare and ethics

3 **Understand the adaptations and status of aquatic mammals**

Evolution: classification; taxonomy; speciation; biogeography

Groups: Cetacea; Pinnipedia; individual species identification and differentiation

Natural history: distribution; demographics; habitat; lifestyle; migration; adaptations; characteristics and behaviour; communication; socio-biology; hunting techniques and prey species; foraging and diet; predation; defence/avoidance; reproductive strategies; intra-specific and inter specific relationships

Conservation: population status; pressures; *in situ* management strategies; *ex situ* captive breeding evaluation; reintroduction potential; case studies; welfare and ethics

4 **Understand the specialisation of Chiroptera, monotremes and marsupials**

Evolution: classification; taxonomy; speciation; biogeography

Groups: Chiroptera; monotremes; marsupials; individual species identification and differentiation

Natural history: distribution; demographics; habitat; lifestyle; adaptations; characteristics and behaviour; communication; socio-biology; hunting techniques and prey species; foraging and diet; predation defence/avoidance; reproductive strategies; intraspecific and interspecific relationships

Conservation: population status; pressures; human conflict; *in situ* management strategies; *ex situ* captive breeding evaluation; reintroduction potential; case studies; welfare and ethics

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**		Assessment criteria for pass **The learner can:**	
LO1	Understand the variations in the natural history of carnivores	1.1	describe the evolution of carnivores to present-day species status
		1.2	evaluate how the lifestyles of carnivores have adapted to suit their particular environments
		1.3	compare differing social and reproductive behaviours of carnivores
		1.4	examine the relative advantages of social and reproductive strategies
		1.5	review the success of current predatory mammal conservation strategies
LO2	Understand the natural history of non-carnivores	2.1	describe the evolution and speciation of non-carnivores
		2.2	discuss the morphological, physiological and behavioural adaptations of non-carnivores in relation to their ecological niches
		2.3	compare the social, foraging and predation evasion behaviour of non-carnivores
		2.4	review the success of current non-carnivore conservation strategies
LO3	Understand the adaptations and status of aquatic mammals	3.1	evaluate the evolution and speciation of aquatic mammals
		3.2	discuss the morphological, physiological and behavioural adaptations of Cetaceans and Pinnipeds to suit their aquatic environments
		3.3	review the behavioural strategies and communication methods used by aquatic mammals during migration, foraging and social interaction
		3.4	discuss current threats affecting specific aquatic environments and their impact on aquatic mammals

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO4 Understand the specialisation of Chiroptera, monotremes and marsupials	4.1 discuss the biogeography and evolution of Chiroptera, monotremes and marsupials 4.2 describe the behavioural strategies and communication methods used by Chiroptera during foraging and social interaction 4.3 review the unique reproductive strategies of monotremes and marsupials 4.4 review the success of current Chiroptera conservation strategies

Guidance

Links

This unit is closely linked with *Unit 9: Principles of Ecology*, *Unit 16: Management of Animal Collections* and *Unit 17: Fish, Game and Wildlife Management*.

Essential requirements

Up-to-date literature on mammalian conservation, including case studies, will be needed to support delivery of this unit.

The use of journals, TV programmes, non-governmental organisation materials and newspaper articles will assist learners in their research. A sufficient stock of library resources including textbooks on evolution, taxonomy, mammalian groups, orders and individual species, behaviour, ecology and conservation must be available for learners.

Employer engagement and vocational contexts

Employers, charitable and conservation organisations, can play a large role in delivery of this unit. The knowledge and experiences of professionals who work with exotic mammals as well as the information regarding conservation strategies and real life case studies will bring a realistic approach to this unit for learners.

Visits to the Natural History museum, zoological collections and exotic animal rescue and welfare organisations will give learners the opportunity to see conservation work in action and could also provide opportunities for work experience.

Guest speakers from organisations such as Born Free, WSPA, Greenpeace and WWF can share their expertise and knowledge of exotic mammals both in captivity and the wild with learners, and also provide current information on the conservation efforts and strategies currently being deployed to preserve mammal species. Employers could liaise with tutors in planning of programmes of learning, enabling visits and providing guest speakers as well as providing specialist resources to support learning.

Unit 25: Manage Animals in Education and Entertainment

Unit code: D/503/1744

Level: 4

Credit value: 10

Aim

This unit aims to develop the management skills and understanding needed to handle and control animals in education and entertainment environments.

Unit abstract

The use of performing animals in education and entertainment is increasingly popular. This unit explores the management of animals within this field. It is important that learners understand the concepts and principles of using animals in education and entertainment, in terms of their welfare, and the health, safety and wellbeing of the handler. Learners will develop the confidence and ability to assess the behaviour of animals and identify abnormal behaviours that may compromise animal performance or demonstrate stress to animals.

Learning outcomes

On successful completion of this unit a learner will:

1 Be able to manage animals in education and entertainment

2 Understand the principles of managing animals in education and entertainment.

Unit content

1 **Be able to manage animals in education and entertainment**

Management of animals: husbandry; correct procedures and processes for maintaining the health of animals; preventative healthcare; use of and when to contact a veterinarian; maintenance of hygiene

Risk assessment: assessing and identifying the risks and hazards associated with performing animals; control measures; Health and Safety at Work Act; COSHH; RIDDOR; environmental risks and hazards; risk assessment during performance; risk assessments including use of special effects and specialist equipment; species specific risks and hazards eg dangerous wild animals

Suitability of the animal for performance: health status; age; life stage; previous experiences; training stage; proximity of other animals; monitoring methods eg monitoring objectives and behaviour; working to deadlines; training progress; when and how to seek expert advice

2 **Understand the principles of managing animals in education and entertainment**

Legislation, ethics and welfare: Performing Animals Act; Animal Welfare Act; Zoo Animals Act; Dangerous Wild Animals Act; ethics of using animals in education and entertainment; advantages and disadvantages of using animals in education and entertainment

Risks to animals and health: common injuries to animals and artistes; control of hazards and risks in the performance area; zoonotic diseases – avoiding the spread; examples; precautions; transmission; signs; treatment; risk of injury from special effects eg fire scenes, flood scenes, wind and rain machines or tunnels; importance of risk assessing new and non-routine activities; use of equipment eg props, camera tracking, lights, treadmills or running machines; cleaning and waste disposal pre and post activity

Signs of stress: species specific; general signs of stress – lack of training progress; illness; abnormal or stereotypical behaviours; self-harm/mutilation; changes in feeding/watering habits and behaviours; aggression; benchmarks for normal behaviours

Training methods: positive reinforcement; negative punishment; use of equipment such as whips; collars; food; toys; use of voice/trainer body language; praise and vocal tools; expert advice; organisations providing advice (specific to species and activity)

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Be able to manage animals in education and entertainment	1.1 assess relevant factors relating to the environment in which the animal will perform 1.2 assess the suitability of the animal to perform 1.3 monitor the animal's welfare and the environment for risks throughout the performance 1.4 take appropriate action to ensure the safety and welfare of the animal, self and others within the education and entertainment environment
LO2 Understand the principles of managing animals in education and entertainment	2.1 outline the legislation relating to the use of animals in education and entertainment 2.2 evaluate the risks to animals from given special effects 2.3 explain signs of stress or abnormal behaviour in an animal being used within an education and entertainment environment 2.4 evaluate different training methods for animals being used within an education and entertainment environment

Guidance

Links

This unit links to the following units in this qualification:

Unit 3: Animal Health and Welfare

Unit 11: Animal Behaviour

Unit 13: Animal Law and Ethics

Unit 15: Principles of Animal Health

Unit 22: Human Animal Interactions.

Essential requirements

Learners must have access to animals in the education and/or entertainment industry, or animals that are brought trained for this purpose. They must also have access to up-to-date risk assessments and equipment that may be used for special effects.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit.

Employer engagement and vocational contexts

Delivery of this unit could be enhanced by the use of guest lecturers and visits to establishments currently training animals for education or entertainment to give learners an insight into how the processes and procedures are carried out in real life.

Guest lecturers could be professionals from animal filming companies, media assistants, animal trainers or behaviourists. Learners should also be introduced to alternative methods of training, for example through professionals from outside the UK, to give them a balanced view of animal training for different purposes.

Learners should be encouraged to carry out case studies on individual animals and training methods to gain an insight into how successful training methods and timescales are.

Links with outside professionals are essential to allow them to participate in this type of study.

Unit 26: Manage the Training of Animals

Unit code: H/503/1745

Level: 5

Credit value: 15

Aim

The unit aims to develop the management skills and understanding related to the training of animals.

Unit abstract

This unit is designed to allow flexibility while training animals encouraging learners to assess the progress of the animals and develop new approaches when the desired results are not achieved. Emphasis is on the learning experience and learners will develop their understanding of the different factors that can affect the training of animals.

Learners will have the opportunity, supported by their supervisors, to negotiate and perform activities which will allow them to fulfil the assessment criteria for this unit. They will recognise the scope of what they have achieved by recording evidence of carrying out the activities.

Learning outcomes

On successful completion of this unit a learner will:

1 Be able to develop an animal training programme

2 Be able to manage the training of animals

3 Understand how to evaluate animal training programmes

4 Understand the theories of animal training.

Unit content

1 **Be able to develop an animal training programme**

Relevant information on animal: five needs; life history; physical capabilities; age; health; sexual status; training history; temperament/personality; breed and parentage; desired appearance; health (vaccinations, allergies etc); microchip

Purpose of training: specific purpose; alter behaviour pattern; socialisation; motivation; emotional factors eg fears, phobias

Plan training: desired behaviour; planning techniques; environmental conditions; appropriate resources in place before training sessions; clear targets set

2 **Be able to manage the training of animals**

Appropriate training sessions: interact with the animal in a humane way which minimises stress and allows training to be carried out safely; methods and resources; approach all interactions with animal(s) in a manner that reinforces desirable behaviour patterns and avoids creating undesirable behaviour patterns; comply with animal welfare legislation and professional responsibilities; appropriate resources; suitable environmental conditions, implement and maintain health and safety guidelines and legislation; communicate effectively with others and seek professional advice when necessary

Assess progress: regular checks to monitor and record progress; compliance with legislation and animal welfare standards; measure progress against specific targets set; seek advice and support as appropriate

Appropriate changes: observe animal behaviour, record findings; assess appropriateness of environment and resources used, make changes as appropriate and justify reasons

Modify training plan: record response of animal to previous training, adjust training plan with justification; environmental conditions, resources

3 **Understand how to evaluate animal training programmes**

Animal needs: five needs of animals; five needs of animal assessment; provision of welfare

Legal compliance: purpose and implementation of current relevant legislation eg Animal Welfare Act 2006, Animals Act 1971, Veterinary Surgeons Act 1966, Health and Safety at Work Act 1974

Species specific training: different techniques appropriate for species eg canines – clicker, positive reinforcement; daily and seasonal rhythms; interaction with humans and other animals

Factors affecting progress: individual animal's physical and mental capabilities, physiological state, psychological state, training environment, equipment and resources, management factors, motivation, relationship with the animal, previous training and life history, animal personality and history

4 **Understand the theories of animal training**

Operant conditioning: definition; Skinner's theory; components and concepts ie reinforcement and punishment; differences between positive and negative reinforcement and positive and negative punishment; how they can be used to establish and maintain desired behaviour; how they can result in undesirable behaviour patterns being maintained and animal becoming resistant to modification; timing and consistency in training, consequence(s) of the extinction of reinforcement; welfare implications

Classical conditioning: positive and negative effects; consequences; practical effects; how it can be used to establish and maintain desired behaviour and learning

Concepts: flooding; systematic desensitisation; counter conditioning; advantages and disadvantages of each concept; appropriate situations for each concept; assessing success and progress of each

Reinforcement: importance of reinforcement; practical use and application; how it is evaluated and assessed

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Be able to develop an animal training programme	1.1 assess relevant information on the animal to be trained 1.2 develop and agree the purpose and intended outcome(s) for the training programme 1.3 plan animal training for a desired behaviour
LO2 Be able to manage the training of animals	2.1 ensure the animal, resources and environment are appropriate for the training sessions 2.2 assess the progress of the training session at regular intervals 2.3 make changes to training activities as appropriate 2.4 modify the training plan as appropriate to take into account the response of the animal to the training
LO3 Understand how to evaluate animal training programmes	3.1 discuss how the five needs of animals may be effectively assessed and addressed 3.2 evaluate different training techniques and their appropriateness for the animal 3.3 explain how different factors may affect the progress and success of the training
LO4 Understand the theories of animal training	4.1 evaluate the use, effects, practical applications and welfare implications of operant conditioning 4.2 evaluate the practical effects and consequences of classical conditioning on animal behaviour and learning 4.3 explain the concepts of flooding, systematic desensitisation and counter conditioning 4.4 evaluate the use and importance of reinforcement in animal training

Guidance

Links

This unit links to the following units in this qualification:

Unit 3: Animal Health and Welfare

Unit 11: Animal Behaviour

Unit 13: Animal Law and Ethics

Unit 22: Human Animal Interactions.

Essential requirements

Learners will benefit from the practical application of techniques in a suitable environment. Learners should be given time to plan and assess training sessions and emphasis should be placed on reflection and continued development to acquire the desired results.

Observation of training techniques should be encouraged and where possible practically demonstrated. Guest speakers or behavioural specialists could enhance the learning experience.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit.

Employer engagement and vocational contexts

To enable learners to gain a wider range of experience, employers could be involved and give examples of behavioural issues in different species, for example farm animals and horses. Visits may be arranged to appropriate establishments to assess animals in different environments.

Unit 27: Plan and Manage the Health and Welfare of Animals

Unit code: K/503/1746

Level: 4

Credit value: 10

Aim

The unit aims to develop the management skills and understanding needed to plan and manage animal health and welfare.

Unit abstract

It is important when carrying out animal care at any level, that learners develop an insight into, and understanding of, factors that influence the management of the health and welfare of animals and the planning and management of animal health and welfare. In this unit learners develop their understanding and ability related to these factors, and will carry out techniques that are acceptable to animal carers, professionals and owners.

Learning outcomes

On successful completion of this unit a learner will:

1 Be able to plan and manage the health and welfare of animals

2 Understand the factors that influence the management of animal health and welfare.

Unit content

1 **Be able to plan and manage the health and welfare of animals**

Planning and monitoring animal health and welfare: defining measurable targets and objectives (sourcing animals, housing and dietary requirements, access and handling by humans, requirements and methods for training and exercise, breeding/neutering considerations); optimising health and welfare depending on why animals are being kept; reasons for planning the health and welfare of animals; consulting with specialists/ advisers such as veterinary professionals and species/ breed specialists; target cost and timescales of health plans; monitoring health of animals regularly with effective use of record-keeping to ensure objectives are being met; evaluation and adaptations to the plans as a result of monitoring activities; risk assessments and hazard perception; additional training required to implement the plans

Development of new techniques: training; professional advice and organisations; cost/benefit analysis of using new technologies and advances; reasons for developing new techniques such as low resistance and broad spectrum medication; advantages and disadvantages of new developments; supervision of others maintaining animal health and welfare

Implementation of the plans: control measures to minimise risks; biosecurity of the area to maintain animal health and welfare; biosecurity to maintain health of self and others; contingency planning; data analysis of plans against benchmark data for the same collections/species; use of animal health and welfare records to inform implementation of the plan including rehoming/culling; communicate use of the plan to others

Resource use: records of animal health and welfare; facilities; supplies for maintaining health, welfare and biosecurity; equipment needed eg for cleaning; medication; use of specialists as a resource; when and how to seek advice from experts/specialists; cost/ time analysis; improving/decrease of profitability from the plan

2 **Understand the factors that influence the management of animal health and welfare**

Diseases and disorders: symptoms, treatment, causes, prevention and management of common diseases affecting a range of species; how biosecurity can influence disease control; environmental factors affecting the spread of disease; procedure for introduction of new animals (testing, quarantine and behaviour); dietary influences on diseases and disorders; poor nutrition and the effects on health and welfare of animals; importance of biosecurity when preparing and providing food to animals; culling; euthanasia

Seeking advice: communication with relevant organisations and professionals to help with animal health management plans; how and when to seek advice or clarification on health and welfare issues

Facilities and resource management: maintenance of resources and equipment; access to professional bodies to give expert advice; maintaining biosecurity when handling animals and equipment; cost of resources and planning against the outcomes and animal welfare; cost effectiveness; time constraints; maintenance of staff records in relation to training courses and level of expertise; use of records for successful implementation of animal management plans

Legislation and animal health: Animal Welfare Act; Animal Health Act; Environmental Protection Act; Misuse of Drugs Act; Veterinary Surgeons Act; public health regulations; farm assurance schemes; codes of practice; Defra codes of recommendation for welfare; World Health Organisation; control of zoonotic and notifiable diseases; species/breed advisory and regulatory organisations eg Kennel Club, GCCF; specific timings of care for production animals

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Be able to plan and manage the health and welfare of animals	1.1 plan animal health and welfare measures to meet intended purpose, objectives and targets 1.2 examine the development of new animal health and welfare technologies 1.3 manage the implementation of a health and welfare plan ensuring use of appropriate resources 1.4 monitor the effectiveness of animal health and welfare measures carried out
LO2 Understand the factors that influence the management of animal health and welfare	2.1 analyse diseases and disorders that may affect animal health and welfare 2.2 explain the role of management systems in the prevention or lessening of the likelihood of animal disease, disorders or other health-related issues 2.3 evaluate the effectiveness of animal health and welfare measures carried out relevant to legal requirements and codes of practice

Guidance

Links

This unit links to the following units in this qualification:

Unit 2: Animal Husbandry Management

Unit 3: Animal Health and Welfare

Unit 15: Principles of Animal Health

Unit 16: Management of Animal Collections

Unit 19: Production Animal Management.

Essential requirements

In this unit learners must be involved in a working animal unit, both practically and 'behind the scenes'. They need adequate access to animal records so they can plan for the health and wellbeing of the animals. Learners must also have access to ICT equipment and the internet, as well as to a range of up-to-date resources and literature including scientific journals.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit.

Employer engagement and vocational contexts

Delivery of this unit would be enhanced by learners being involved in running an animal unit, where they could plan animal health and welfare routines including all aspects of their care from preventative treatment to day-to-day care and veterinary appointments and emergencies.

Learners will benefit from guest speakers and visits to organisations such as veterinary hospitals, laboratories, animal collections and establishments. This would give them a balanced view of other establishments and how the daily management of their animals is carried out. Learners could use case studies to evaluate the differences between care plans at different establishments, and then analyse reasons for these differences.

Unit 28: Plan, Monitor and Evaluate the Nutrition of Animals

Unit code: M/503/1747

Level: 4

Credit value: 10

Aim

The unit aims to develop the management skills and understanding needed to plan, monitor and evaluate the nutrition of animals.

Unit abstract

Anyone with responsibility for animal nutrition must understand why, what and how those animals are fed. Learners will develop their understanding of how different animal species have differing digestive systems and processes and, as a result, have vastly different nutritional requirements. Learners will consider why feedstuffs formulated for one species may be completely unsuitable for another.

Learners will develop an understanding of how an animal's nutrition is managed to promote performance, health and welfare, examining how nutritional problems can arise and how they may be solved. The need to manage animal nutrition whilst complying with legislation and codes of practice and ensuring the health and safety of those involved is essential and is emphasised throughout the unit.

The nutritional requirements of an animal change throughout its life and especially according to how it is expected to perform. Learners will formulate, implement and monitor nutrition plans for animals. They will evaluate and adapt these plans according to how well the animal functions, using key indicators to benchmark performance.

Learning outcomes

On successful completion of this unit a learner will:

1 Be able to plan the nutrition of animals

2 Be able to monitor and evaluate the nutrition of animals

3 Understand the management of animal nutrition.

Unit content

1 **Be able to plan the nutrition of animals**

Nutrition plans: purpose of planning; cost implications; use of feed additives and associated withdrawal periods; routine and prescriptive nutrition plan components eg feeding frequency, type and content of feedstuffs available; feed storage considerations, hygiene and biosecurity; ensuring that facilities and staff are adequate for successful plan implementation; use of feed as enrichment and in training; implementation of nutrition plan for a given animal

Changing circumstances as appropriate: seasonal changes; condition; age; pregnancy; lactation curves; production stage; illness; activity levels

2 **Be able to monitor and evaluate the nutrition of animals**

Animal health and performance: key indicators of malnutrition, poor health and good health eg body condition scoring, infection, changes in behaviour, lameness, unsatisfactory performance; how to obtain and critically appraise expert advice; current legislative requirements and practical interpretation eg Defra Codes of Recommendations for Welfare

Evaluation of nutrition plans: suitable indicators of effectiveness of diet eg improved condition, improved performance, good health, avoidance of metabolic disorders; suggested changes if diet does not meet targets, including cost effectiveness, for a given species

Purposes of record keeping: traceability; ensuring that feeding programmes are being followed; following organisational standards; legislative requirements and codes of practice

Feedstuffs and supplements: purpose of using different feeds including palatability and effect on animal welfare; purpose of supplements and blends; best practice when storing and preparing rations eg personal protective equipment, hygiene, preventing feed contact with wildlife and contaminants; knowledge and avoidance of prohibited substances in feedstuffs eg processed animal proteins (PAPs); tests to ensure quality assurance standards are met for feed and water; proper disposal of uneaten/deteriorated feed

3 **Understand the management of animal nutrition**

Digestive system: structure and importance regarding animal health and welfare as related to species eg monogastric, ruminant, hindgut fermentation, avian; mother-rearing and hand-rearing

Nutritional requirements for different species: quantities and roles of water, carbohydrates, proteins, lipids, vitamins, minerals and fibre

Feedstuffs: availability; palatability; digestibility; feed tables; selection of feed; preparation; nutritional labelling; ration calculation (including least cost formulation), proper storage and disposal

Performance of different species: eg production of milk, eggs, wool, meat; competition animals and effect of performance requirements on nutritional requirements

Identifying and solving nutritional problems: importance of gradually introducing changes to diet; identification and rectification of nutrient deficiencies and excesses eg minerals, water, lipids, energy; practical problems with feeding eg methods, space, quantities, weather, pests, feeding behaviours

Diet planning: using external advice; role of a nutritionist; legislation, regulations and codes of practice (including reporting and recording arrangements); rationale for reviewing and communicating policies to others involved such as veterinary surgeons and staff

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Be able to plan the nutrition of animals	1.1 formulate animal nutrition plans for a variety of circumstances 1.2 implement nutrition planning for animals using appropriate resources
LO2 Be able to monitor and evaluate the nutrition of animals	2.1 assess the effect of nutrition on an animal's performance 2.2 evaluate the benefits of improved nutrition on animal health and performance 2.3 evaluate the impact and effect of feedstuffs and supplements on animal health and performance 2.4 monitor animal performance using appropriate resources 2.5 evaluate the effectiveness of a plan for the nutrition of given species
LO3 Understand the management of animal nutrition	3.1 discuss the digestive processes linked to animal species, animal health and wellbeing 3.2 discuss the nutritional requirements appropriate for different species 3.3 explain the role of a nutritionist in planning diets 3.4 discuss the links between animal nutrition and environmental factors 3.5 examine nutritional problems relating to performance or diet

Guidance

Links

This unit links with *Unit 2: Animal Husbandry Management*, *Unit 3: Animal Health and Welfare*, as well as *Unit 7: Biological Principles*, *Unit 10: Anatomy and Physiology*, *Unit 13: Animal Law and Ethics* and *Unit 19: Production Animal Management*.

Essential requirements

Learners must have access to the internet and to specialist textbooks at level 3 and above.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit.

Employer engagement and vocational contexts

It would be useful for learners to integrate work placements with assessment if possible. Employers such as veterinary practices, animal collections and farmers are ideally placed for learners to enable learners to see the effects of nutrition on healthy and unhealthy animals.

Feed producers and retailers can often provide visiting speakers and specialist literature that can illustrate the theory within this unit. Opportunities for the observation and/or undertaking of feeding regimes in a variety of situations via visits, practicals and placements should be included.

Unit 29: Plan and Manage Breeding Programmes for Animals

Unit code: T/503/1748

Level: 4

Credit value: 10

Aim

The unit aims to develop the management skills and understanding needed to plan and implement animal breeding programmes.

Unit abstract

Many people working closely with animals needs to understand how to manage and plan animal breeding programmes. Animal production can be very rewarding if planned and managed correctly, and is an area that generates much interest. In this unit learners will consider the key concepts of planning and managing breeding programmes, as well as understanding the many factors that can influence and affect animal breeding.

Learning outcomes

On successful completion of this unit a learner will:

1 Be able to manage breeding programmes for animals

2 Understand factors influencing breeding programmes.

Unit content

1 **Be able to manage breeding programmes for animals**

Breeding plans: objectives of breeding eg purpose for which animals are to be bred; cost effectiveness; amount of offspring produced versus amount required; procedural planning for sale or transfer of progeny; planning for breeding; planning for intervention; maintenance of animal welfare throughout breeding; availability and suitability of resources (nutrition, housing, husbandry, environment) and staffing for successful implementation of the plan; risk and hazard assessment and control

Compliance and advice: legislation eg Breeding and Sale of Dogs (Welfare) Act; Animal Welfare Act; governing bodies; regulatory codes of practice eg Kennel Club breeding standards, GCCF, Companion Animal Welfare Council; specialist external advice on breeding – where and when to obtain; assurance schemes eg hip scoring, eye scoring, checking for breed/species hereditary issues

Mating and parent choice: sire/dam compatibility; requirements from the mating eg colour/size of offspring; certain traits and characteristics; agreeing choice of parents against objectives and organisational requirements; assessing health and suitability of dam and sire, including prophylactic treatments both prior to mating and during gestation as appropriate; clear communication of agreed policies to those who need to be informed eg veterinarian, animal owner, stud book keeper

Recording and communication: breeding records; sire and dam records; records of offspring produced and hereditary/breeding problems that may occur; importance of accurate recording systems; maintenance of records; evaluation and adaptation of breeding plans according to progress record changes, clear communication to those who need to be informed

2 **Understand factors influencing breeding programmes**

Sources of information for animal breeding: previous breeding/individual performance records; stud books; specific animal data from organisations and pedigree certificates; IT databases; how and when to obtain this data to optimise the success of the breeding plan

Genetics: laws of inheritance; sex determination; prediction of outcomes of mating including desirable and undesirable traits as linked to animal purpose; linkage; sex linkage; epistatic effects; inbreeding, line breeding, cross breeding, hybrid vigour; monohybrid and dihybrid crosses; rates of genetic gain and performance; calculation of genetic merit and potential risks

Use of technological advances: sexed semen; embryo transfer; cross-breeding; inter-breeding; advantages and disadvantages of breeding technologies; alternatives to modern technologies; effects on breeding programmes

Reporting and communication: reporting and recording procedures under legislation eg Zoo Animals Act; Breeding and Sale of Dogs Welfare Act; Animal Welfare Act; codes of practice; Defra Codes of Recommendation for welfare; procedures for communicating policies, processes and practices; regular reviewing of plans; modifying plans when necessary; ways to modify programmes and communicate modifications to others

Ethical considerations: compliance with relevant legislation and welfare standards; short- and long-term implications for parents and other animals of breeding; surplus animals

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Be able to manage breeding programmes for animals	1.1 plan animal breeding to meet intended purposes, objectives and targets 1.2 manage the implementation of mating from chosen parents to meet breeding objectives and animal welfare requirements 1.3 manage the implementation of suitable animal breeding plans 1.4 evaluate progress of breeding programmes and adapt as necessary
LO2 Understand factors influencing breeding programmes	2.1 evaluate sources of information on animals for breeding 2.2 assess potential merits of planned mating 2.3 explain the desirable and undesirable traits specific to an animal's purpose 2.4 examine the implications of inbreeding, line breeding, cross breeding, genetics and resultant hybrid vigour

Guidance

Links

This unit links to *Unit 19: Production Animal Management*.

Essential requirements

For this unit learners must be involved in planning for and managing the breeding animals in a specified situation. Learners need access to the internet and up-to-date and relevant literature and journals.

Animal welfare requirements must be paramount at all times. Animals must not be subjected to stress or overuse during delivery of this unit.

Employer engagement and vocational contexts

Learners would benefit from guest lecturers from breeding establishments for different animals, such as animals in a laboratory, production animals, pets and animals with specific uses such as guide dogs.

Learners would benefit from visiting establishments where guest lecturers work to gain an insight into the day-to-day planning for and managing the breeding of animals, from the stages of deciding on a sire/dam to following it through and predicting the outcomes of breeding and the mating/pregnancy process.

Unit 30: Health and Safety in the Land-based Workplace

Unit code: D/503/1100

Level: 4

Credit value: 15

Aim

The aim of this unit is to develop learners' understanding about their responsibilities in ensuring the health and safety of the land-based workplace and the people within it.

Unit abstract

Health and safety is an essential consideration for all persons working within the land-based sector and this unit will enable learners to develop an understanding of the importance of continually monitoring the implementation of health and safety legislation and policies within a land-based setting.

Learners will gain a clear understanding of the implications of relevant legislation for their own role and the implementation of policies and systems in their own workplace. The importance of record keeping, monitoring and review health and safety policies and procedures will also be considered.

Elements of this unit should be contextualised, where possible, to an appropriate setting relevant to learners' workplace within the land-based sector.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand how health and safety legislation is implemented in a land-based workplace

2 Understand how health and safety requirements impact on the land-based workplace

3 Understand the monitoring and review of health and safety in the land-based workplace.

Unit content

1 **Understand how health and safety legislation is implemented in the land-based workplace**

Concept of risk, safety and security: minimum risk; zero risk; risk for employees; customers; general public; visitors; trespassers ; public liability; hazard; accident prevention; first aid; security; machinery, equipment and implements; animals; plants; substances; risk and COSHH assessments; safe codes of practice; equipment; premises; storage; national occupational standards.

Systems, policies and procedures for communicating information: exemplar pro-formas; training; organisational culture; use of different media; exchange of information; record keeping; enforcement; compliance

Responsibilities for management of health and safety: organisational responsibilities (employers; employees including casual and fractional staff; external agencies; contractors; sub-contractors; external suppliers and service providers) monitoring and evaluating processes; auditing; inspecting the workplace; management structure and representation

Legislative requirements: current legislation, regulations and codes of practice relevant to health and safety in a land-based industry setting eg Health and Safety at Work Act 1974, Health and Safety (First Aid) Regulations 1981, Management of Health and Safety Regulations 1999, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995, Control of Substances Hazardous to Health 2002, Manual Handling Operations Regulations 1992, Food Safety Act 1990, Food Safety (General Food Hygiene) Regulations 1995, Workplace (Health, Safety and Welfare) Regulations 1992, Disability Discrimination Act 1995, Food and Environment Act (FEPA) 1985; Health and Welfare at Work(Control of Vibration) Regulations 2006; Working at Height Regulations 2005; Control of Noise at Work Regulations 2005; Provision and Use of Work Equipment Regulations 1998; Health and Safety (Consultation with Employees) Regulations 1996, Pressure Systems Safety Regulations 2000, Lifting Operations and Lifting Equipment Regulations 1998

Training and implementation: pesticides storage and use; machinery including chainsaws, brushcutters, diggers, and ground maintenance machinery; manual handling; poisonous and hazardous plants; risk assessments; safe working practices; induction training; management and supervisor training including IOSH and NEBOSH; provision of personal protective equipment

2 **Understand how health and safety requirements impact on the land-based workplace**

Work place planning: static and mobile workplaces and teams; meeting needs of business; ensuring safety; principles of good practice; maintenance and monitoring procedures; staff training

Dilemmas: risk-benefit analysis; risk to self and others; resource implications; differing priorities between stakeholders; differences in priorities within both permanent and temporary work places

Implications of non-compliance: financial; legal; moral; physical; health; reputation

3 **Understand the monitoring and review of health and safety in the land-based workplace**

Monitor and review: active and reactive monitoring; audit of risks; review of practice; learning from experience; updating and implementation of policies and procedures; health surveillance; consultation.

Positive health and safety culture: individuals; teams; managers; organisational levels

Own contributions: responsibilities; compliance; training; practices; interactions with individuals, groups, agencies, contractors and sub-contractors

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand how health and safety legislation is implemented in a land-based workplace	1.1 review systems, policies and procedures for communicating information on health and safety in a land-based workplace in accordance with legislative requirements 1.2 assess the responsibilities in a specific land-based workplace for the management of health and safety in relation to organisational structures 1.3 analyse health and safety priorities appropriate for a specific land-based workplace
LO2 Understand how health and safety requirements impact on the land-based workplace	2.1 analyse how information from risk assessment informs planning for individuals and organisational decision making 2.2 analyse the impact of one aspect of health and safety policy on land-based practice 2.3 discuss how dilemmas encountered in relation to implementing systems and policies for health, safety and security may be addressed 2.4 analyse the effect of non-compliance with health and safety legislation in a land-based workplace
LO3 Understand the monitoring and review of health and safety in the land-based workplace	3.1 explain how health and safety policies and practices are monitored and reviewed 3.2 analyse the effectiveness of health and safety policies and practices in the workplace in promoting a positive, healthy and safe culture 3.3 evaluate own contributions to ensuring the health and safety needs of individuals

Guidance

Links

Within this unit there are direct links to the land-based professional bodies and national occupational standards and professional guidance that they oversee and implement which include the following areas and industries: horticulture, agriculture, equine, arboriculture, countryside management, floristry and animal management.

This unit has links with all of units as health and safety forms a key component within all of them.

Essential requirements

Tutors must be conversant with the application of health and safety legislation in relevant settings.

The learner's evaluative account of one aspect of health and safety in the workplace must be validated. This could be in the form of a witness statement from a workplace supervisor, or an observation record from their assessor.

Learners must be given the opportunity to carry out a risk assessment within the workplace.

Ideally this would be in a setting relevant to their occupational sector, but if this is not possible a simulation of the setting will suffice. Access to IT, internet facilities, library resources including occupational magazines is also required.

Employer engagement and vocational contexts

Visiting speakers from relevant settings and health and safety specialists would help learners to understand of legislative requirements and their management – especially for those learners undertaking a simulated risk assessment. Also work placements within the students chosen field should also be encouraged which will them to undertake risk assessments within an industrial setting but also give them scope for further research and investigation.

Unit 31: Environmental Management

Unit code: F/503/1056

Level: 5

Credit value: 15

Aim

This unit aims to provide an understanding of how an organisation's commercial activities will impact on the environment, how these activities might be altered in order to minimise their impact on the environment and how this can be done in a manner that ensures the continued profitability of the organisation.

Unit abstract

Our natural environments face threats from both an increased demand for its resources from a growing human population and from the impact of the waste generated to meet these requirements. By undertaking this unit, the learner will gain an increased understanding of several of the key aspects relating to recognising, and dealing with, these threats.

The necessity of developing sustainable methods for meeting our needs is a key concept in this unit. Learners will also gain an understanding of how our activities impact upon the natural environment and how this can be monitored and reduced. Environmental management policies, legislation and techniques are considered alongside the roles of organisations involved in this area. The learner will also understand the need for effective waste management and reduction and the various approaches used to achieve these outcomes.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the concept of sustainability in a land-based sector

2 Understand the impact of land-based activities on the environment

3 Understand the need for environmental management

4 Understand the need for waste management in a land-based sector

5 Be able to devise environmental policy in a land-based sector.

Unit content

1 **Understand the concept of sustainability in a land-based sector**

Sustainability: conservation of the natural environment; renewable and non-renewable resources; biodiversity; the Earth's life support systems and processes; the depletion of finite resources; the Earth's carrying capacity; duty of care; the quality of human life

Factors: commercial decision-making; economic; socio-political; legal; codes of practice; ecological; scientific and technological information

Sustainable practice: changes to existing practice; use of alternative technology and resources; legislation and regulation; commitment; corporate policy

2 **Understand the impact of land-based activities on the environment**

Direct: pollution (atmosphere, water and soil); acid deposition; food contamination; soil exhaustion; waste; loss of visual amenity; animal and human health disorders; transport; increased population; global warming; ozone layer depletion; depletion of natural resources; loss of biodiversity and habitats

Indirect: customer pressure; social change and environmental awareness; insurance industry and lenders changing policies of property and land ownership issues; employees' raised awareness and concerns about health; EU and UK legislation; markets; prices

Monitoring and assessment: self-regulation; non-government organisations (NGO's); independent environmental consultants; legislation; field surveys; literature reviews; collection; storage; analysis and presentation of information; local information sources

Environmental performance: Environmental Impact Assessment (EIA); management systems; organisational design and decision-making cultures; monitoring change; reaching environmental targets; required investment; savings to organisations and the environment; quality systems

3 **Understand the need for environmental management**

Approaches: objectives; policies; strategies; operational; legal requirements; organisational commitment

Organisational culture: corporate responsibility/values; environmental values and attitudes; education and training for staff; contribution of the individual; community at large; public information

Environmental policy: allocation of responsibility; record keeping; targets; waste minimisation and recycling; energy use and conservation; reduction in costs; environmental sensitivity; environmental audits; health and safety legislation; technological efficiency; public information

Legislation: self-regulation; UK legislation and EU directives; enforcement agencies eg DEFRA, Environment Agency; pressure groups eg Greenpeace, Friends of the Earth

4 **Understand the need for waste management in a land-based sector**

Factors: training; implementation; monitoring use of energy and waste; purchase of specific equipment and plant; cost benefits to the organisation

Benefits of waste reduction: conservation of energy; use of by-products; on-selling of waste products; increased sales from greening of products/processes; cost reduction; increased market share; customer retention; increased loyalty and image

Methods of reduction: initial product design; natural methods versus chemical treatment; recyclable material; use of biodegradable materials; reparability versus replacement; benefits of design to meet legislation; "technofix" solutions

5 **Be able to devise environmental policy in a land-based sector**

Factors: training; implementation; monitoring use of energy and waste; purchase of specific equipment and plant; cost benefits to the organisation

Methods of reduction: initial product design; natural methods versus chemical treatment; recyclable material; use of biodegradable materials; reparability versus replacement; benefits of design to meet legislation; "technofix" solutions

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the concept of sustainability in a land-based sector	1.1 analyse factors that affect the sustainability of a land-based organisation/enterprise's activities 1.2 explain how a selected organisation/enterprise might improve sustainable practice on a local and national scale
LO2 Understand the impact of land-based activities on the environment	2.1 evaluate direct and indirect impacts of current environmental issues on industry, organisations and stakeholders 2.2 explain how environmental performance is monitored in a land-based organisation/enterprise 2.3 assess the environmental impacts of a selected land-based organisation/enterprise 2.4 explain how environmental performance can be improved in a land-based organisation/enterprise
LO3 Understand the need for environmental management	3.1 examine different approaches to environmental management within organisations in a relevant land-based sector 3.2 examine how organisations in a relevant land-based sector can be more environmentally aware 3.3 explain the impact of UK and EU environmental legislation with which organisations in a relevant land-based sector must comply
LO4 Understand the need for waste management in a land-based sector	4.1 examine different approaches to waste management in organisations in a relevant land-based sector 4.2 examine the different types of waste that are produced by organisations in a relevant land-based sector 4.3 justify ways in which land-based organisations in a relevant sector could reduce waste 4.4 evaluate the environmental and commercial benefits of reducing waste for a chosen land-based organisation
LO5 Be able to devise environmental policy in a land-based sector	5.1 devise appropriate environmental policy for a selected land-based organisation/enterprise 5.2 recommend suitable ways to reduce waste and recycle in a selected land-based organisation/enterprise

Guidance

Links

This unit considers aspects of sustainability, the impact of human activities upon the environment and environmental and waste management. It has links to other units for example *Unit 2: Animal Husbandry Management, Unit 3: Animal Health and Welfare, Unit 17: Fish, Game and Wildlife Management.*

Essential requirements

A diverse library resource and access to the internet will increase opportunities for learner-centred research and numerous websites dealing with environmentalism and environmental management are freely available online. The use of audio-visual materials such as slides, documentaries and debates, etc would also further engage learners in the learning experience.

Employer engagement and vocational contexts

Learners would benefit from visits to organisations and businesses such as water treatment works, waste management sites, power stations and sources of renewable energy. Lectures from appropriate guest speakers would further enhance and contextualise their learning experience and introduce learners to a broader range of professionals and career opportunities available in this subject area. Relating the unit content to the work of organisations such as The Institute of Environmental Management and Assessment (IEMA), Natural England, The Scottish Environment Protection Agency (SEPA) and the Centre for Alternative Technology (CAT) will also strengthen the vocational context.

Unit 32: Sustainable Development

Unit code: M/503/1148

Level: 5

Credit value: 15

Aim

This unit aims to raise awareness of sustainable development issues, to encourage a sense of responsibility and citizenship, an appreciation of the needs of others both now and in the future, and respect and value for the diversity of life.

Unit abstract

It is now commonly accepted that there is great need to ensure that human activities do not cause permanent damage to the environment and that future generations should not be denied resources. It is believed that economic and social goals should be achieved in ways that can be supported for the long term by conserving resources, protecting the environment and ensuring human health and welfare

Those employed in the land-based sector should have an understanding of the concept of sustainable development, and an appreciation of the main mechanisms for its implementation.

This unit enable learners to study the core themes and issues of sustainable development. It raises awareness of: sustainability issues; responsibility and citizenship; the needs of others now and in the future; and the requirement to respect and value the diversity of life.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand principles of sustainable development

2 Understand the impact of production, trade and biotechnology on diversity

3 Understand the concept of citizenship and individual responsibility in the promotion of sustainable development

4 Understand the impact of changes towards sustainability.

Unit content

1 **Understand principles of sustainable development**

Principles: concept of sustainable development (to include the different contexts in which sustainable development can be placed)

Earth and man: Gaia evolution; human demographics; agricultural development; the industrial revolution; resource consumption and pollution; development of global and local transport systems

Inter-dependence: dynamic nature of generation relationships (with examples to illustrate changes over time and space)

Values and beliefs: examples to illustrate different attitudes towards sustainable development and values between cultural and income groups (to include an examination of the balance of power and vested interests)

Needs and rights: present imbalance of population and resource usage; locally and globally; the wealth gap between and within countries; measures of standard of living (eg Gross National Product) and the developing measures of quality of life; the concept of social justice

2 **Understand the impact of production, trade biotechnology on diversity**

Evidence: qualitative and quantitative evidence as indicators of the changes in biological, cultural and economic diversity; local; global

Impacts: examples to illustrate the impacts on biological, cultural and economic diversity of globalisation of production; trade and consumption; the dominance of multinational enterprises in decision making

Technological developments: the effects of changes in transport and telecommunications on trade and production; impacts on cultural and economic diversity; developments in bio-technology and genetic engineering; impacts on bio-diversity; genetically modified organism (GMO) debate

Recent changes: application of appropriate technology (eg wood-burning stoves and mini-hydro electric power schemes), promotion of local trade (eg ‘farmers’ markets’ in the UK)

3 **Understand the concept of citizenship and individual responsibility in the promotion of sustainable development**

Stewardship: illustrative examples to promote an understanding of the term, the need for individual as well as collective responsibility; Local Agenda 21 and the development of the slogan ‘think global act local’

Active citizenship: need for individual participation, the contribution of voluntary personal controls; use of resources towards sustainable development; the value and process of collective decision making; ecological footprints

Social justice and equity: contrasting examples of different values and beliefs on behaviour and lifestyles; the need to promote sustainable lifestyles; the need for personal changes in lifestyles and habits to promote sustainable behaviour in the home/workplace/centre; the ethical arguments for promoting sustainable development

4 **Understand the impact of changes towards sustainability**

Pressure groups: the role of pressure groups in promoting change (eg Greenpeace); the use of renewable materials; ethical investments and fair trade

Sustainable production: sustainable production methods in forestry and woodland products; less intensive agricultural systems; organic production; resource minimisation in industry and commerce

Legislation and policies: regulations to promote waste minimisation and a more sustainable use of resources eg packaging regulations, the landfill tax, environmental taxation, eco-labelling, incentives to reuse and recycle, Local Agenda 21

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand principles of sustainable development	1.1 examine the main sustainable development principles 1.2 summarise the different interpretations of the concept of sustainable development 1.3 evaluate the need to address both inter-generational and intra-generational equity 1.4 discuss the debate between individual and collective interests
LO2 Understand the impact of production, trade and biotechnology on diversity	2.1 evaluate the evidence that indicates global production and trade has had an impact on biological, cultural and economic diversity 2.2 examine the impact of the globalisation of production and consumption on biological, cultural and economic diversity 2.3 evaluate the implications of recent trends towards localisation of economic activity in the promotion of diversity 2.4 assess the impact of biotechnology on bio-diversity
LO3 Understand the concept of citizenship and individual responsibility in the promotion of sustainable development	3.1 examine the concept of stewardship relating this to selected examples 3.2 compare values on ethical issues related to sustainable development 3.3 evaluate the policies and attitudes of a local authority or place of work/study to citizenship and individual responsibility
LO4 Understand the impact of changes towards sustainability	4.1 assess the importance of pressure groups in promoting sustainable change 4.2 discuss the effectiveness of recent legislation introduced to promote a more sustainable use of resources 4.3 evaluate recent changes to a production system to promote sustainable development 4.4 critically assess lifestyle and behaviour in relation to own eco-footprint

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Guidance

Essential requirements

Access to a well-resourced library, the internet and quality newspapers are essential. Sustainable development is topical and thus newspaper articles and radio/television items provide current information. Information from the local authority, local groups involved in sustainable development activities and Local Agenda 21 will be invaluable. Visits and relevant external speakers will enhance tutors as well as learners' knowledge.

Employer engagement and vocational contexts

A team of employers could be identified to support the different units. Employers could help tutors, for example, with the planning of programmes of learning, or provision of visits, guest speakers and mentors. They could also help to design assessment activities.

The delivery of this unit would be enhanced by employer engagement involving, for example, local organisations, for example Environmental Consultants. Learners could, for example, meet with employers from the industry to learn about current issues and trends in the sector. Sustained links with the groups may support further units as well as work placement opportunities. A talk by a representative of the Environment Agency would help learners understanding of how the Environmental sector responds to change and the impacts of changes on the sector.

Unit 33: Project Management for Land-based Industries

Unit code: K/503/1052

Level: 4

Credit value: 15

Aim

The aim of this unit is to equip learners with the understanding and practical experience to identify, develop and contribute to the management of projects developed to support organisational and commercial initiatives, by planning, recording and monitoring all aspects of projects.

Unit abstract

At this level, it is imperative that learners are able to successfully manage projects within their chosen land based sector or industry. Not only does this prepare learners for management level employment, but it also enables learners to gain necessary skills that will equip them for future employment such as planning, overseeing, recoding, analysing and monitoring projects, all of which can be used as transferable skills.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the appropriate characteristics of projects that can be applied to land-based industries

2 Be able to generate project plans that can be applied to identified requirements and needs

3 Be able to implement planning, recording and reporting strategies

4 Understand approaches to monitoring activities that ensure effective delivery.

Unit content

1 **Understand the appropriate characteristics of projects that can be applied to land-based industries**

Characteristics: organisational needs and abilities; goals; determining appropriate goals for the organisational needs; functions of the project; how to assess the functions; products of the project; essential personnel involved in the project; land based organisations and their values and how these are achieved; organisational staffing; selection of group to be involved in the project

Features: features of the project environment (audience, market, compatibility with local environment, effect on habitats and species, stakeholders, affected personnel); baseline assessment of attributes of features; relationships between internal and external stakeholders eg partners, steering groups, project team, volunteers, contractors; organisational structures for managing a project

Influencing factors: social; financial; environmental; political; factors affecting target condition; ability to influence factors; identification and qualification of project activity

2 **Be able to generate project plans that can be applied to identified requirements and needs**

Objectives: developing and determining objectives appropriate to the project; local and environmental factors; generating work programmes and the influences on this; sequencing project activities; techniques for identifying essential activities.

Resource acquisition: cost estimation; financial breakdown of project; funding/finance (sources, procurement); cost cutting; influences on cost of project; contingencies; how to propose cost estimation to personnel involved with funding (stakeholders, audience and organisations); methods of acquiring funding for the project

3 **Be able to implement planning, recording and reporting strategies**

Planning activities: breakdown of project into sections; storage and retrieval systems; identifying and analysing existing work methods; specifying new methods and their validity; resource requirements; accessing resources; operational/organisational guidelines

Recording systems: techniques for recording activities and outcomes; assessing and evaluating activities (qualitative and quantitative)

Reporting information: internal and external reporting of outcomes and progress; communication and disseminating successful and unsuccessful outcomes; methods of communication appropriate to audience; (wider audience, iterative/summative, various media)

4 **Understand approaches to monitoring activities that ensure effective delivery**

Risk management: robust risk management implementation; risk register; effective prioritisation of tasks

Adaptive management: learning culture; planning and reviewing; feedback from activities; from feature attributes

Performance and target condition indicators: key indicators; concepts; target condition indicators; selection criteria for identification and use of indicators

Protocols: monitoring performance (technical, social, economic); monitoring target conditions (socio-economic, ecological); assessment; analysis and interpretation of activity performance and impact; trend analysis

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the appropriate characteristics of projects that can be applied to land-based industries	1.1 explain the relationship between organisational needs and abilities, and project goal(s), functions and products 1.2 determine appropriate features of the project environment 1.3 analyse a project's ability to influence factors affecting a target condition 1.4 explain the relationships between internal and external stakeholders for project management
LO2 Be able to generate project plans that can be applied to identified requirements and needs	2.1 generate an appropriate objective and work programme to meet a specified target condition 2.2 propose an appropriate cost estimate for conducting a programme of work
LO3 Be able to implement planning, recording and reporting strategies	3.1 assemble an effective specification for a practical work activity 3.2 record the outcomes of a completed work activity 3.3 interpret the outcomes of a completed work activity 3.4 present valid information regarding the outcomes of successful and unsuccessful project activities
LO4 Understand approaches to monitoring activities that ensure effective delivery	4.1 examine the importance of robust risk management for projects 4.2 explain the process of adaptive management 4.3 justify the selection of performance and target condition indicators 4.4 evaluate activities selected to monitor performance and target indicators

Guidance

Links

This unit has links to the following units in this qualification:

Unit 1: Business Environment

Unit 5: Research Project

Unit 6: Work-based Experience

Unit 34: Small Business Enterprise

Unit 38: Employability Skills.

Essential requirements

Learners must have access to the internet, spreadsheet and word processing facilities. Access to well stocked, recent literature on project management must be made available.

Employer engagement and vocational contexts

Learners should discuss their work with real project managers to enhance their understanding of the methods and techniques necessary for managing a land based project.

The learners would benefit from being involved in running an actual or simulated project, for example a fund raising event for a charity or for the centre. This could involve the learners planning and pitching the project to the centre's staff or personnel, achieving funding for the project, carrying it out and then analysing the final project.

It would also benefit the learners if they had opportunity to evaluate and analyse other projects, whether carried out in the centre or at a different location, and then feed this information back to others.

Visiting speakers from charities and companies in the land based sector would benefit the unit, with a participative input from the learners on their own projects and how they are managing them.

Unit 34: Small Business Enterprise

Unit code: H/601/1098

Level: 5

Credit value: 15

Aim

The aim of this unit is to give learners the opportunity to develop skills in change management, reviewing and improvement of the performance of a small business enterprise.

Unit abstract

This unit examines the factors influencing the development and expansion of small business enterprise. The unit draws together many of the topics covered in the wider curriculum and also in other Higher National units and allows learners to apply these skills to the small business environment. The unit is appropriate for learners who are / or plan to become involved in small business enterprises.

Learning outcomes

On successful completion of this unit a learner will:

1 Be able to investigate the performance of a selected small business enterprise

2 Be able to propose changes to improve management and business performance

3 Be able to revise business objectives and plans to incorporate proposed changes

4 Be able to examine the impact of change management on the operations of the business.

Unit content

1 **Be able to investigate the performance of a selected small business enterprise**

Business profile: vision, goals, components, objectives, strategies and business processes; internal and external factors affecting business performance; performance measures, constraints and restrictions on business; responsibilities and liabilities of owner-managers

Business performance: skills audit; self evaluation / comparisons with similar sized businesses in the same or similar industry and geographical area, comparisons with industry averages. (Comparisons should cover financial, production, marketing, sales, human resources, use of technology)

Business strengths and weaknesses: overall effectiveness and business performance review products/services; marketing; sales; production; finances; human resource efficiency; management effectiveness; use ratios; SWOT analysis; budget information; market research results; business image; business reports

Management of employees: employment policies; employment initiatives eg Investors in People; employee performance appraisal process; flexible working eg employment of part-time and temporary staff, teleworking, homeworking, job sharing, zero hours contracts, annual hours, staggered hours, compressed hours; equal opportunities within the workplace; discrimination (forms, legislation against)

2 **Be able to propose changes to improve management and business performance**

Problem solving actions: problem solving strategies to overcome identified weaknesses; sources and availability of professional advice; alternative solutions; availability and use of outsourcing for specific functions eg payroll, debt collection, staff development.

Maintaining and strengthening existing business: maintaining appropriate performance records; building on business strengths; maintaining market share/position; importance of good customer/supplier/adviser relationships

New opportunities: identifying areas for expansion eg niche markets and export opportunities where appropriate, research techniques, evaluating projects, assessing project requirements, costing and finding finance for new projects, risk assessment

3 **Be able to revise business objectives and plans to incorporate proposed changes**

Business objectives: structure of business objectives; assessment of business objectives in the light of current performance; making changes to business objectives; impact of changes on business plans

Business plans: structure of integrated business plans (financial, sales and marketing, production/output, personnel); use of business plans; evaluation of plans against business objectives; incorporating changes to plans; budgeting for changes; preparation of business forecasts

Action plans: plans to implement changes; systems to manage; monitor and evaluate changes; performance measures; setting deadlines

4 **Be able to examine the impact of change management on the operations of the business**

Impact of change: effects of change on all areas of business – finance; workloads; morale; job roles; physical aspects (eg office space, production methods), use of technology, anticipating possible obstacles/problems

Management of change: monitoring effects of change; maintaining systems and records to evaluate impact of change; appropriate revision of plans in response to actual results

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Be able to investigate the performance of a selected small business enterprise	1.1 produce a profile of a selected small business identifying its strengths and weaknesses 1.2 carry out an analysis of the business using comparative measures of performance
LO2 Be able to propose changes to improve management and business performance	2.1 recommend with justification, appropriate actions to overcome identified weaknesses in the business 2.2 analyse ways in which existing performance could be maintained and strengthened 2.3 recommend with justification, new areas in which the business could be expanded
LO3 Be able to revise business objectives and plans to incorporate proposed changes	3.1 produce an assessment of existing business objectives and plans 3.2 revise business plans to incorporate appropriate changes 3.3 prepare an action plan actions to implement the changes
LO4 Be able to examine the impact of change management on the operations of the business	4.1 report on the impact of the proposed changes on the business and its personnel 4.2 plan how the changes will be managed in the business 4.3 monitor improvements in the performance of the business over a given timescale

Guidance

Links

This unit has links with other units such as:

Unit 35: Land Use Issues and Regulations

Unit 38: Employability Skills.

Essential requirements

It is essential for learners to be able to access realistic, contextualised case studies using data from sector-specific enterprises unless they are able to access this data from local enterprise and/or their own experience.

Employer engagement and vocational contexts

Local small enterprise may consider advantages in sharing information in order to gain new thoughts to develop business opportunities and options.

Business links may provide some useful contact and materials to support development within this unit.

Unit 35: Land Use Issues and Regulation

Unit code: D/503/1095

Level: 5

Credit value: 15

Aim

This unit aims to develop a coherent understanding of land management issues including the juxtaposition of competing land uses and the strengths and weaknesses of different land management approaches.

Unit abstract

This unit aims to develop learners knowledge and understanding of contemporary land use and land management. It focuses on the types and current systems of land use and how these are affected by a range of factors. Land use patterns, practices and problems are a key feature of understanding how land is managed. The learner will also develop an understanding of the need for land use regulation and how this is managed. The state role in managing land use will be evaluated, along with contemporary changes to the regulatory system. Why might these be happening? How much of our land use is dictated by state involvement? The concept of integrated land use will also be considered. Land use is closely tied in with sustainability – how do these tie together? Is the current system of land use sustainable and could changes be made to improve land use sustainability?

Learning outcomes

On successful completion of this unit a learner will:

1 Understand current land management

2 Understand the nature and extent of current land use regulation

3 Understand the success of contemporary adjustments to land use regulation

4 Understand sustainable land use management.

Unit content

1 **Understand current land management**

Land management types: exploitative, protective, productive

Land use patterns: factors affecting land use eg climate, topography, soils, population, infrastructure, historical/cultural

Land use practices and problems: factors affecting land use practices eg legislation, financial; problems eg pollution, waste, noise, conflicts with other land uses, effects on habitats/wildlife, effects on people

2 **Understand the nature and extent of current land use regulation**

Regulation: structure of system; bodies involved in regulation; need for regulation; types of regulation affecting land use eg planning laws and guidance, protective designations (National Park, SSSI, AONB etc)

State intervention: reasons for state intervention in land use; current policies regarding reduction or increase in state intervention; impact of state intervention

3 **Understanding the success of contemporary adjustments to land use regulation**

Contemporary adjustments: current adjustments being considered or enacted; predicted success or otherwise of adjustments; reasons for adjustments

Integrated land use regulation/strategy: definition; key features; factors leading to success; possible problems

4 **Understand sustainable land use management**

Sustainable development: definition; key principles; relation to land management;

Sustainability of current land use management: case for/against the sustainability of current land use; changes to land use systems to improve sustainability

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand current land management	1.1 explain factors influencing management of given exploited, protected and productive land uses 1.2 analyse current practices and problems related to a specific land use
LO2 Understand the nature and extent of current land use regulation	2.1 evaluate the need for land use regulation 2.2 examine the need for state intervention in land use 2.3 analyse the impact of state intervention
LO3 Understand the success of contemporary adjustments to land use regulation	3.1 justify the rationale behind contemporary adjustments to land use planning 3.2 discuss the concept of integrated land use 3.3 evaluate the success of given integrated land use strategies
LO4 Understand sustainable land use management	4.1 explain how the principles of sustainable development can relate to land use management 4.2 critically evaluate the sustainability of current land use management 4.3 suggest appropriate adjustments to given land use systems to improve sustainability

Guidance

Essential requirements

Access to internet resources, in addition to written texts and journals. The use of 'real' sites, either as remote or direct access for case studies will be invaluable.

Employer engagement and vocational contexts

Delivery of the unit would be greatly enhanced by links with professionals engaged in 'land management' of any type eg farmers, developers, foresters, conservation site managers.

Unit 36: Teaching a Specialist Subject

Unit code: K/500/9925

Level: 4

Credit value: 15

Aim

This unit aims to enable learners to develop the knowledge and understanding required when teaching a specialist subject.

Unit abstract

This unit gives learners the opportunity to identify the techniques and approaches to teaching and learning that are relevant to a specialist area. Exploring the range of philosophical approaches to teaching and learning will demonstrate the importance of adapting approaches when planning learning, in order to achieve specific learning objectives for a specialist area.

Learners will explore the specific range of delivery techniques and resources suited to a particular specialist area, identifying good practice and using this in the design and planning of learning objectives. The unit also highlights the importance of adopting an inclusive approach through selecting methods that meet learner needs to engage them in the learning activities, with the use of appropriate specialist resources.

The unit focuses on current curriculum requirements and the need for updating in the specialist subject area, including opportunities to incorporate new and emerging technologies and review their importance in relation to meeting individual and subject needs.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the aims and philosophy of education and training in own specialist area

2 Understand the aims and structure of a range of courses and qualifications available in own specialist area

3 Understand principles of inclusive learning and teaching and key curriculum issues in own specialist area

4 Understand how to use a range of specialist resources for inclusive learning and teaching

5 Understand and demonstrate how to work with other teachers and trainers within own specialist area

6 Understand how to evaluate, improve and update own specialist knowledge and skills.

Unit content

1 **Understand the aims and philosophy of education and training in own specialist area**

Aims: accessing subject-specific, up-to-date information from appropriate professional and vocational bodies; recognising the needs of current professional and/or vocational standards; current local/national legislation; major changes in standards relating to specialist subject or area; rights and responsibilities of specialist area; policies and procedures such as awarding body; issues associated with specific learner requirements

Philosophical issues: researching background of specialist area to establish underlying philosophical principles and how these inform associated professional standards and practice; professional values and visions and how these inform teaching and learning in the specialist area; approaches to teaching specialist knowledge to suit content eg encouraging independent research, didactic or pedagogic approaches for delivery; approaches to encourage learners to practise skills eg experiential, kinaesthetic principles, practice; opportunities to engage learners in developing reasoning eg debate, discussion

2 **Understand the aims and structure of a range of courses and qualifications available in own specialist area**

Structure: explore organisational policies and provision eg equal opportunity and access to courses, association with vocational and awarding bodies; organisational provision and marketing of courses in specialist area eg prospectus and course handbooks; awarding body regulations and specifications/standards eg National Occupational Standards, National Vocational Qualifications, unit assessment, curriculum requirements; scheme of work, syllabus, linking to assessment strategy and content requirements; learning outcomes and assessment criteria requirements; unitary, modular or holistic approach

Planning and preparation: programme planning; team working; establishing learner needs in terms of specific achievement goals; planning varied approaches to engage learners in achieving specialist goals eg teacher-centred and learner-centred teaching and learning, blended learning, bite-size chunks; clear and appropriate subject/specialist specific aims and objectives, suitable range of approaches and activities to ensure variety and engagement of learners, use of specialist resources and assessment activities to suit the subject specialism and the needs of learners

3 **Understand principles of inclusive learning and teaching and key curriculum issues in own specialist area**

Inclusive approach: design programme to ensure equality of opportunity in specialist area eg all learners can access learning at appropriate level; specialist language accessible to learners; group and individual activities to engage all learners eg subject/area specialism reflected through collaborative working and/or team teaching, demonstration, role play, games, discussion, visits, distance learning, online learning, research, experimentation, work-based and workshop-based learning where appropriate, supported or independent study, appropriate level of challenge

Approaches to include key curriculum: awareness of new approaches to teaching and learning; incorporating different learner needs and styles; variety of specialist methods to engage and motivate learners – addressing their needs; incorporating specialist learning activities; use of subject specialists for specific delivery and opportunities to incorporate a realistic, specialist learning environment eg visits, simulations; preparing for employment through incorporating the relevance of the specialist area and teaching; appropriate use of new specialist technologies eg materials developed for interactive whiteboards, PowerPoint, internet/intranet, VLE (virtual learning environment eg Moodle); flexible/blended learning approaches to encourage learner responsibility and interest

4 **Understand how to use a range of specialist resources for inclusive learning and teaching**

Range of resources: range of appropriate specialist resources eg handout design, format to meet the needs of a wide range of learners, case studies, notes, summaries, specialist materials – videos, textbooks, artefacts, models, exemplar materials, adaptation of existing and commercial packages to meet learner needs, new and emerging technologies – audio and visual aids, personal computers and range of software packages, CD ROM, specialist internet/intranet, adapting and developing specialist areas of virtual learning environment (VLE), specialist materials developed for activeboard/interactive board; encouraging development of subject-specific areas in learning centres

Inclusiveness in resource design: adopting a range of specialist teaching and learning resources; awareness of group and individual needs; emphasis on the use of resources so learners can be actively involved – encouraging interaction eg through simulation; avoidance of over-use of technology to avoid learners tuning out and becoming bored; variation of resources, handouts, 'the Real Thing', internet and intranet for learner and teacher research, for subject/specialist area updating to increase flexibility of approach, access to teacher-devised specialist learning packages to meet learner needs, subject/specialist learning networks

5 **Understand and demonstrate how to work with other teachers and trainers within own specialist area**

Opportunities for liaison: core team meetings; individual research and sharing experiences and good practice; team building; cross curriculum teams for sharing wider skills and experiences; use of staff development and in service training (INSET); incorporation of opportunities for engagement with external agencies – vocational and professional specialists, awarding body subject specialist meetings/networking and updating/specialist training; work shadowing/placement; emailing and online sharing of experience, mailshots, awarding body online updating, maintaining network contacts; establishing and maintaining good relations with external verifier/examiner as way of keeping up with changes in specialist area/awarding body standards

Impact of liaison: sharing good practice eg team meetings for the purpose of cascading/dissemination of information reflecting subject/area updating, develop alternative strategies for teaching and learning appropriate to the specialist area and learner needs, collaboration in design of programme incorporating different skills and experiences, sharing practice in design and evaluation of resources, value and respect for experienced team members, incorporation of skills, knowledge and experiences from workplace/industry, linking community needs to specialist area

6 **Understand how to evaluate, improve and update own specialist knowledge and skills**

Strengths and development needs: evaluation of specialist personal skills required for teaching and learning in specific programme/syllabus or curriculum area, formal and informal processes for personal evaluation of subject/area specific curriculum to meet learner needs for inclusion; using reflective practice in evaluating own approaches to teaching knowledge, skills and understanding; using feedback from others in evaluating personal skills and attributes in relation to planning a specific subject/area teaching and learning programme eg learners, peers, line manager, team, observations; recording of positives and negatives in own practice in specialist area for actioning; responsiveness to learners and colleagues

Developing and updating specialist knowledge/skills: plan/take up opportunities to improve own specialist practice eg Personal Development Journal/Reflective Journal to plan for own learning opportunities; individual research into current specialist curriculum developments and updating own specialist knowledge, skills and understanding; specialist staff development opportunities; identifying opportunities for INSET provision with appropriate bodies; specialist higher level qualifications eg higher degrees/Masters/PhD; professional – specific academic or professional practice; specialist vocational updating; secondment, work shadowing or work placement

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the aims and philosophy of education and training in own specialist area	1.1 review key aims of education and training in own specialist area 1.2 discuss key philosophical issues relating to education and training in own specialist area
LO2 Understand the aims and structure of a range of courses and qualifications available to learners in own specialist area	2.1 summarise the aims and structure of a range of key courses and qualifications in own specialist area. 2.2 justify how own approach to the planning and preparation of a particular course or qualification in own specialist area enables identified aims to be met
LO3 Understand principles of inclusive learning and teaching and key curriculum issues in own specialist area	3.1 discuss the inclusiveness of own approach to the planning and preparation of a particular course or qualification in own specialist area 3.2 justify how own approach to the planning and preparation of a particular course or qualification in own specialist area takes account of key curriculum issues, including the role of new and emerging technologies
LO4 Understand how to use a range of specialist resources for inclusive learning and teaching	4.1 review a range of learning and teaching resources, including new and emerging technologies, discussing their effectiveness in meeting individual learning needs 4.2 explain and justify the inclusiveness of own use of a range of resources
LO5 Understand and demonstrate how to work with other teachers and trainers within own specialist area	4.1 review a range of opportunities to liaise with other teachers and trainers within own specialist area. 4.2 review the impact of liaising with other teachers and trainers within own specialist area on own practice
LO6 Understand how to evaluate, improve and update own specialist knowledge and skills	4.1 review own approaches, strengths and development needs in relation to own specialist knowledge and skills 4.2 discuss how to develop and update own specialist knowledge and skills

Guidance

Links

This unit links with other units in the programme such as *Unit 11: Animal Behaviour*, *Unit 25: Manage Animals in Education and Entertainment* and *Unit 26: Manage the Training of Animals*.

Essential requirements

Learners need access to specialist tutors who understand the techniques and resources best suited to specialist delivery, which in this case is likely to be riding and/or stable management instruction. Opportunities for discussions with more experienced colleagues, and access to specialist tutors, will provide an essential source of support and guidance. It is important that a number of teaching practice observations are conducted by a subject specialist, aware of the specific skills, knowledge and understanding appropriate to the specialism.

Access to up-to-date specialist background knowledge and information is essential to support learners in planning and developing specialist teaching techniques and advanced learning activities appropriate to the specific learning outcomes and different learner needs. It is also essential that learners have access to background reading material to cover the philosophical principles and models that can be related to the specialist area.

Multimedia computers, specialist software packages, normal photocopying facilities and other reprographic arrangements need to be available, together with access to ICT and presentational equipment (preferably including video and PowerPoint).

Employer engagement and vocational contexts

Developing relationships with employers through work-related experience will give learners opportunities to undertake teaching practice for example in riding schools and training centres. It would also be beneficial to develop links with relevant awarding bodies, for example the British Horse Society, to ensure up-to-date information is available on the range of qualifications available.

It would be valuable for learners to observe teaching and coaching sessions delivered by qualified teachers/instructors in a range of different settings.

Guest speakers with expertise in using specialist resources such as a VLE would enhance delivery.

Unit 37: Environmental Education and Interpretation

Unit code: M/503/1585

Level: 5

Credit value: 15

Aim

This unit provides the learner with a coherent understanding of the methods for providing environmental education for all sectors of society. The historical aspects of environmental education will be linked to local and wider global awareness and be related to environmental good practice and sustainability.

Unit abstract

This unit provides the learner with a coherent understanding of the methods for providing environmental education for all sectors of society. Environmental activities suitable for implementation in schools, colleges and the community will be linked to interpretation techniques to provide a wide range of strategies for use in countryside management.

The historical aspects of environmental education will be linked to local and wider global awareness and be related to environmental good practice and sustainability.

Learners will be encouraged to communicate environmental information using a range of practical and theoretical approaches. Organisational skills, teaching methods and the implementation of safe working strategies will lead to developing leadership and teamwork skills for successfully organising programmes for educational activities.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the development of environmental education

2 Understand environmental teaching and learning opportunities

3 Be able to plan and evaluate environmental activities

4 Understand the use of interpretative media in environmental education.

Unit content

1 **Understand the development of environmental education**

History of environmental education: development of environmental awareness and global policies formulating the background to the education of important issues and their implementation at national and local levels in the education system and society; the Rio Summit; Agenda 21 and the concept of sustainability

School environmental education: the introduction; development and links of the National Curriculum at primary and secondary levels in Britain; links to education in other countries; current global awareness; internet education links

Further and higher education provision: specialised studies (eg scientific, social and outdoor education); careers in environmental education and interpretation in the public and private sector

2 **Understand environmental teaching and learning opportunities**

Outdoor education opportunities: school grounds; habitat-based visits (eg woodland sites, farmland, wetland, coastal, grassland, urban); short visits; field trips and study tours; residential courses; scientific and other curriculum-based studies; social-based studies linked to direct appreciation and environmental awareness (eg environmental 'games'); individual and group-based studies and surveys

Environmental awareness activities: studies linked to environmental problems (eg 'acid rain', deforestation, energy use, changes in agriculture land use, pollution, population changes, transport, other social issues)

Conservation and practical work: environmental organisations and their activities; group work; surveys; wildlife trusts; societies; community projects; creation; management and reclamation work at rural and urban sites

3 **Be able to plan and evaluate environmental activities**

Legislation for environmental education: safety and legal guidelines (eg for local authorities, independent education centres, voluntary organisations); codes of conduct; names and contact requirements; authorisation for activities; insurance; in-service and leadership training; first-aid requirements

Risk assessments: site assessments; equipment safety and use, weather conditions, personal details and medical problems; specific risks (eg Weil's disease, Lyme's disease)

Activity planning: aims; objectives; timing of events; clothing; food; transport; routes; equipment; group organisation and management; teamwork within organisations and developing good working relationships with visitors; volunteers and others; information provision for events; courses and other activities; case studies and hypothetical programme planning; evaluation; records and modification for future events

4 **Understand the use of interpretative media in environmental education**

The principles and background of interpretation: interpretative design and the development of its use in Britain; historical use and the modern media; museums; visitor centres; country parks; rural and urban opportunities

Interpretative media: to include themed activities, guided walks, interpretative panels, leaflets, posters, videos, computer-interactive media, sensory walks, simulations, 'living history' events and exhibitions

Evaluation of interpretation techniques in environmental education: critical appraisal and use of media to enhance education at events and site locations, case studies, visits, project work

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the development of environmental education	1.1 discuss events contributing to the development of environmental education 1.2 examine contributions of environmental education to the curriculum at primary and secondary levels 1.3 explain the range of environmental studies used in the education system 1.4 compare environmental educational career opportunities in the public and private sectors
LO2 Understand environmental teaching and learning opportunities	2.1 critically evaluate the study habitats available for environmental education 2.2 justify appropriate teaching and learning activities for school grounds 2.3 explain activities linked to enhancing environmental awareness of local and global issues 2.4 evaluate the educational activities of key environmental organisations
LO3 Be able to plan and evaluate environmental activities	3.1 summarise the legal and safety aspects of planning environmental education activities 3.2 assess the risks of an activity in detail 3.3 propose a comprehensive action plan for an environmental event or visit 3.4 evaluate the success of an environmental activity suggesting modifications for future use
LO4 Understand the use of interpretative media in environmental education	4.1 examine past and current use of interpretative media in environmental educational 4.2 evaluate the use of various interpretive media in a land-based sector 4.3 critically appraise an environmental education case study or site visit

Guidance

Links

This unit links with application of other units and other units such as *Unit 14: Animal Industry and Trade*, *Unit 22: Animal Human Interactions* and *Unit 25: Manage Animals in Education and Entertainment*.

The unit *Sustainable Development* is very closely linked to this unit, especially with the appreciation in schools of the links to Agenda 21 and energy use in current society (see notes for content of learning outcomes 1, 2 and 3).

Essential requirements

Learners need to have access to a well-resourced library, the internet and computer facilities for interpretation development. Other resources could include the use of cameras, videos and other media.

Employer engagement and vocational contexts

Learners could be given the opportunity to work with local schools, visitor groups and others, through visits to school sites and/or other educational centres/sites. Visiting speakers with current experience of education and/or community-based work would help learners to understand current issues.

Unit 38: Employability Skills

Unit code: A/601/0992

Level: 5

Credit value: 15

Aim

The unit aims to develop the skills and understanding relevant to learners preparing to enter the work place.

Unit abstract

Learners at all levels of education and experience require honed employability skills as a prerequisite to entering the job market. This unit gives learners an opportunity to assess and develop understanding of their own responsibilities and performance in, or when entering, the workplace.

It considers the skills required for general employment, such as interpersonal and transferable skills, and the dynamics of working with others in teams or groups including leadership and communication skills.

It also deals with the everyday working requirement of problem solving which includes the identification or specification of the 'problem', strategies for its solution. Learners will be able to explore what motivates people at work and how this can improve the quality of their performance.

Learning outcomes

On successful completion of this unit a learner will:

1 Be able to determine own responsibilities and performance

2 Be able to develop interpersonal and transferable skills

3 Understand the dynamics of working with others

4 Be able to develop strategies for problem solving.

Unit content

1 **Be able to determine own responsibilities and performance**

Own responsibilities: personal responsibility; direct and indirect relationships and adaptability; decision-making processes and skills; ability to learn and develop within the work role; employment legislation, ethics, employment rights and responsibilities

Performance objectives: setting and monitoring performance objectives; SMART targets for own effectiveness against set objectives

Improvement: review own performance against set objectives; action plan areas to be developed; recommendations for improvement of own performance

Motivation and performance: application and appraisal of motivational theories and Techniques eg Maslow, Hertzberg; rewards and incentives; manager's role and leadership style; self-motivational factors; performance feedback, positive praise, meeting of targets

2 **Be able to develop interpersonal and transferable skills**

Problem solving: problem analysis; researching changes in the workplace; generating solutions; choosing a solution

Effective communication: verbal and non-verbal – awareness and use of body language, openness and responsiveness, formal and informal feedback to and from colleagues; ICT as an effective communication medium; team meetings; appropriate communication for various levels

Time management: prioritising workload; setting work objectives; making and keeping appointments; time for learning; reliable estimate of task time; strategies eg Gantt chart action planning, involvement of others – their availability

3 **Understand the dynamics of working with others**

Working with others: roles of individuals within a team; nature and dynamics of team and group work; informal and formal settings, purpose of teams and groups eg long-term corporate objectives/strategy; problem solving and short-term development projects; flexibility/adaptability; team player; shared goals

Team dynamics: Analysis model eg Tuckman, Belbin, Adair; core competencies of team, individual skills and strengths used for maximum benefit of team, leadership styles; identification of team/work group roles; stages in team development eg team building, identity, loyalty, commitment to shared beliefs

Task and team goals: selecting team members eg specialist roles, skill and style/approach mixes; action planning; monitoring and feedback; effective leadership skills, eg, setting direction, setting standards, motivating, innovative, responsive, effective, communicator, reliability, consistency; focus on efficiency to achieve team goals

4 **Be able to develop strategies for problem solving**

Tools and methods: problem-solving methods and tools eg brainstorming, performance evaluation, 5 whys, cost benefit analysis, force field analysis, route cause analysis; identification of multiple solutions, selecting best possible solution, justify why alternative solutions are not selected

Strategy formation: identification and definition of the problem; analysis and clarification eg scope, size, impact of problem; factors for strategy development eg timescale, resources, finances, roles and responsibilities, barriers, aims and objectives; develop appropriate strategy

Impact of implementation: impacts positive and negative, efficiency, cost effectiveness, performance measures eg customer satisfaction, employee motivation; competitiveness; quality assessments; evaluation of the resolution of the problem, emergent problems, measuring and monitoring of solution against objectives and desired outcomes; sustainability

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Be able to determine own responsibilities and performance	1.1 develop a set of own responsibilities and performance objectives 1.2 evaluate own effectiveness against defined objectives 1.3 make recommendations for improvement 1.4 review how motivational techniques can be used to improve quality of performance
LO2 Be able to develop interpersonal and transferable skills	2.1 develop solutions to work based problems 2.2 communicate in a variety of styles and appropriate manner at various levels 2.3 identify effective time management strategies
LO3 Understand the dynamics of working with others	3.1 explain the roles people play in a team and how they can work together to achieve shared goals 3.2 analyse team dynamics 3.3 suggest alternative ways to complete tasks and achieve team goals
LO4 Be able to develop strategies for problem solving	4.1 evaluate tools and methods for developing solutions to problems 4.2 develop an appropriate strategy for resolving a particular problem 4.3 evaluate the potential impact on the business of implementing the strategy

Guidance

Links

This unit links with *Unit 5: Research Project* and *Unit 6: Work-based Experience*.

Essential requirements

Access to a range of work-related exemplars (for example development systems, team health checks, job descriptions, action plans, communication strategies) will be required when delivering this unit. Case studies based on relevant sectors, workshops, career talks or work based mentors will also be useful in the teaching and learning aspect of the unit.

Learners must generate assessment evidence through a range of possible activities such as individual work placements, project management, research reports, development of case studies, working with others (for example employee-supervisor roles, teamwork, group work) and everyday communication within the workplace.

Employer engagement and vocational contexts

Due to the nature of the unit employer engagement should be actively encouraged within the delivery of the content. Where possible learners should be able to contextualise their learning within a realistic work environment. Projects or problem solving activities could be undertaken within local businesses with support of employers. Clear outcomes should be discussed and agreed with learners developing an understanding of problems within a business and potential barriers to overcome when finding a possible solution.

Guest speakers could be scheduled into delivery to enhance the vocational context. Case studies could be substituted for real life work problems that learners are asked to investigate solutions for. With employer involvement various assessment criteria could be covered in a real business situation, this needs to be negotiated by tutor.

Unit 39: Research Methods for Land-based Industries

Unit code: A/503/1153

Level: 4

Credit value: 15

Aim

This unit introduces learners to methodologies employed when carrying out research. It develops learners' knowledge of the range of information sources available and should equip them with practical skills in planning a piece of research.

Unit abstract

The ability to successfully formulate research questions, and gain data for analysis in an attempt to answer them, are vital skills for learners working in this programme area. Understanding the concepts considered in this unit will greatly assist the learner with these skills.

Learners will be introduced to different forms of data and how it can be both generated by them and accessed from existing sources. Several of the major analytical and descriptive techniques used to interpret the resulting data are then utilised to help in its interpretation. Once learners have gained these skills, research topics applicable to their subject area and interests can be considered in more detail.

How to plan, conduct, interpret and present the resulting findings (together with their significance), from research projects are all addressed in this unit. Learners will gain vital preparation to assist them in undertaking their own research in their studies or future careers by completing this unit.

Learning outcomes

On successful completion of this unit a learner will:

1 Be able to collect and interpret data and information in a land-based industry

2 Be able to plan research in a land-based industry

3 Be able to review data from a range of sources in a land-based industry

4 Be able to present findings appropriately.

Unit content

1 **Be able to collect and interpret data and information in a land-based industry**

Nature of data: primary and secondary data; qualitative; quantitative; objective; subjective; accuracy; precision; errors; significance; reliability

Data collection: probability sampling: eg random, systematic, stratified, clustered; non-probability sampling: eg convenience, voluntary, quota; purpose: eg event sampling, time sampling

Data analysis: descriptive statistics eg proportions, percentages, ratios, range; inferential statistics to assess the significance of results using chi-squared and Student's t-Tests

Simple interrelationships: correlation

Complex relationships: multivariate analysis

2 **Be able to plan research in a land-based industry**

Research a subject specific research title: preliminary review of sources of information; discussions with tutors; agreement of research aims; research objectives; hypotheses and research title; appropriate size and nature of research

Programme of work: outline of methodology and resources; proposed analysis and interpretation; regular reviews of progress; appropriate and achievable target dates set; flexible approach within framework

3 **Be able to review data from a range of sources in a land-based industry**

Existing data: literature; accessing professional expertise via eg verbal questioning, email, letters; related studies; historical data; current data; introductory texts; published and unpublished work; popular media eg television, radio, newspapers; computer-based sources eg CD Rom, Internet; multimedia eg DVD, video, slides, audio tape; abstracts; reports; journals

4 **Be able to present findings appropriately**

Critical review: discussion of opposing views in an informed and balanced manner; all views are accurately referenced; discussion of methodologies and content; suggested sources of error and improvement of methodology

Suitable format: oral; visual and written; professional presentation; appropriate level for audience eg peer group, tutors; style appropriate to audience and research; scientific conventions followed

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Be able to collect and interpret data and information in a land-based industry	1.1 explain the nature of research data 1.2 determine sources of error in data collection 1.3 carry out a range of data collection techniques 1.4 analyse simple data using descriptive and inferential statistical techniques
LO2 Be able to plan research in a land-based industry	2.1 determine appropriate sources of information and advice 2.2 plan resource requirements, methodology and analysis 2.3 agree research aims, objectives and title with an appropriate authority 2.4 submit work proposals with appropriate and achievable target dates
LO3 Be able to review data from a range of sources in a land-based industry	3.1 critically review appropriate existing data from a range of sources
LO4 Be able to present findings appropriately	4.1 present report findings using appropriate mediums 4.2 prepare a summary of findings suitable for display to a given audience

Guidance

Links

This unit serves as a valuable introduction to several major aspects of research, and also common pitfalls, and would therefore benefit the delivery of *Unit 5: Research Project*. The knowledge and skills contained within it would also be of value to any learner wishing to continue their higher education or those seeking to progress onto a managerial level career.

This unit links with all units that require any degree of literature review, data handling or presentation skills. It may therefore be considered as a means of developing the learner's study skills at an early stage in the programme.

Essential requirements

As this unit has a high degree of directed study, a well-resourced library or learning resource centre is essential. Access to multimedia provision and to the Internet enables learners to access diverse information sources and should allow learners to recognise the strengths and weaknesses of all data sources.

Learners will require access to suitably qualified staff which may necessitate cross-curricular tutoring. Tutor time is therefore an essential resource. It is not anticipated, or expected, that learners have unlimited access to tutor support, but sufficient timetable allocation should be made to ensure that learners receive support in developing their skill base.

Employer engagement and vocational contexts

The data collection, analysis and presentation skills gained from this unit will benefit the learner in their studies and future careers. The skills and knowledge acquired through this unit will enable the learner to successfully undertake future research in subject-specific areas.

Unit 40: Visitor Attraction Management

Unit code: R/601/1758

Level: 4

Credit value: 15

Aim

This unit aims to give learners an understanding of the range and importance of visitor attractions in the land-based sector, factors affecting their successful establishment and development, and the impact of management techniques on their sustainability.

Unit abstract

Visitor attractions are an increasingly significant feature within the land-based sector, especially as public interest in the environment, conservation and sustainability continues to develop.

This unit gives learners a broad understanding of the nature, development and management of visitor attractions within the sector. The unit highlights the range of visitor attractions within the land-based sector, their importance at a local, regional, national and sometimes international level, and the potential conflicts between the different reasons underpinning their existence.

Learners will investigate the different types of visitor, their needs and motivations, and the impacts of visitors on different types of attraction, as well as gaining an understanding of the relevant tourism theories. The unit also enables learners to explore the development process for establishing a new visitor attraction.

Learners will review the techniques available to managers of visitor attractions and the impact of these techniques on the sustainability of the attraction.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the scope and importance of visitor attractions

2 Understand visitor types, impacts and tourist motivation theories

3 Understand issues affecting the development process in visitor attraction management

4 Understand the application of management techniques and their impact on sustainability.

Unit content

1 **Understand the scope and importance of visitor attraction**

Scope: purpose built attractions eg zoo, botanical gardens, farm park, countryside centre; built or established with another primary purpose that have become visitor attractions eg historic estates and gardens, forests and woodland; natural attractions eg coastal areas, National Parks, lakes and rivers; purpose of attraction eg educational, entertainment, recreational, conservation, species protection, cultural development, for health and wellbeing, community engagement; overlaps of scope and/or purpose eg a natural attraction that includes a purpose built feature, attractions which have multiple purposes; tensions between purposes eg conservation and recreation

Importance: for conservation purposes (locally, regionally, nationally, internationally); educational benefits; cultural and heritage; to the local, regional and national economy; to the local community eg employment opportunities, changes to transport routes, business opportunities, attracting tourism

2 **Understand visitor types, impacts and tourist motivation theories**

Visitor types: market segmentation eg demographic, geographic, socio economic; special interests, characteristics and profile; individuals and groups (organised, eg clubs, societies, schools, interest groups; ad hoc eg family, friends)

Visitor needs and motivations: facilities required eg access, transport and parking, hospitality, signage and interpretation; reasons for visiting eg entertainment, recreation, education, special interest

Impact of tourism: negative impacts eg congestion, pollution, increased risk of accidents, damage or disturbance to flora and fauna, overcrowding, erosion, increased demand for facilities, requirement for maintenance, effects of visitors on captive animals, birds or aquatic species; positive impacts eg income, increased public awareness, opportunities for support, source of potential volunteers

Tourist motivation theories: theories eg 'responsible tourism' (Goodwin, 1998), the 'smart consumer' (Voase, 2002)

3 **Understand issues affecting the development process in visitor attraction management**

Issues: location eg natural, aesthetics, existing amenities; opportunities; incentives, transport routes, access, catchment areas, restrictions on land use; land and reclamation; technology; legislation; pollution eg air, water, land, visual, noise; health and safety implications; funding eg private sector, public sector (local, regional, UK, EU), grants, loans, membership schemes; stakeholders; attraction management; tourism consultants; local authorities; local communities; tourist boards; private enterprise; public sector; pressure groups; organisations eg National Trust, English Heritage, Natural England, The Forestry Commission, Environment Agency, Department for Environment, Food and Rural Affairs (Defra), British Waterways, Sport England

Development Process: processes eg project management, feasibility study, market research, design, local community involvement, planning applications, construction period, landscaping, establishment of plants and animals, planning visitor routes and walkways, access and signposting, information and educational facilities, facilities and amenities, recruitment, training, marketing, opening event, customer care, crowd management, reservations and ticketing, internal and external communication

4 **Understand the application of management techniques and their impact on sustainability**

Supply: services eg visitor flows, flexible capacity (extended opening hours, peak strategies – specific time slots, differentiated pricing, increased staff levels, additional tills/eating area, identified routes within attraction, use of zoning, multi-skilling of staff); increasing capacity (additional buildings/attractions/facilities); security, health and safety

Demand: influence the number, characteristics or behaviour of visitors including price incentives; loyalty discounts/season tickets; payment structure (eg all inclusive ticket, payment for different parts of the attraction, payment according to time required); marketing; interpretation; education

Renewal: product life cycle, visitor expectations, passive and active modes of delivery; innovation eg new adventure, new theme, new area; addition of extra facilities and services, eg concerts and plays in historical gardens, “behind the scenes” experiences in zoos and animal parks

Sustainability: economic (international, national, regional, local); visitor expectations (negative impacts result in lack of repeat business); social eg heritage, culture, lifestyle; environmental eg conflict between conservation and recreation, conflict between visitor numbers/access and preservation of natural attraction; visitor education to promote sustainability within the attraction eg use of recycling, avoiding flash photography, use of public transport, use of recognised walkways, involvement in maintenance of the attraction through volunteer work

Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the scope and importance of visitor attractions	1.1 discuss the overlap of visitor attractions to particular types of attraction 1.2 analyse the importance of different visitor attractions
LO2 Understand visitor types, impacts and tourist motivation theories	2.1 evaluate the needs and motivations of different visitor types 2.2 evaluate impacts of tourism on visitor attractions 2.3 analyse the effect of different theories of tourist motivation on the management of visitor attractions
LO3 Understand issues affecting the development process in visitor attraction management	3.1 discuss processes and potential issues involved in the development of visitor attractions
LO4 Understand the application of management techniques and their impact on sustainability	4.1 analyse different visitor management strategies 4.2 evaluate management techniques in relation to sustainability

Guidance

Links

This unit links with *Unit 6: Work-based Experience*.

Essential requirements

Visits to a variety of attractions within the land-based sector are essential.

To ensure learners have the opportunity to visit a range of visitor attractions, costs must be identified in advance and learners made aware of them. Where possible, learners should visit at least one purpose-built attraction, one non-purpose-built, a natural attraction and an event. This will show learners the range of attractions, similarities and differences, and also, of particular importance, issues in relation to management of attractions.

Employer engagement and vocational contexts

Tutors could establish links with nearby visitor attractions as appropriate to the sector. It would be particularly useful to establish links with a relatively new or developing attraction if possible, to enable learners to appreciate the range of considerations in establishing, developing and managing an attraction. It would also be of benefit to establish a link with a nationally important attraction, such as the Eden Project, Kew Gardens or Longleat Safari Park as well as attractions run on a much smaller scale such as a local farm park, countryside centre or historical gardens.

The unit is especially appropriate for fieldwork-based investigation and a portfolio of research could form part of the assessment. Learners should be given the opportunity to meet managers/employees of visitor attractions. Such contacts could be useful data resources for learner research. Case study materials on visitor attractions in the UK and worldwide are recommended. National Parks authorities, English Heritage and National Trust are good sources of research materials.

Unit 41: Human Resource Management

Unit code: K/601/1264

Level: 4

Credit value: 15

Aim

The aim of the unit is to provide an understanding of the personnel function of management through the consideration of systems and frameworks which create and sustain the employment relationship within the organisation.

Unit abstract

Human resources are the most important investment any business or organisation can make. The efficient and effective management of these resources is therefore vital to the success of any enterprise. This unit will enable learners to understand the principles and practices of modern human resource management including the recruitment, selection and retention of staff. Through the study of local land-based enterprises, learners will also be able to appreciate the impact of human resource management on workplace culture and practices.

Learning outcomes

On successful completion of this unit a learner will:

1 Understand the difference between personnel management and human resource management

2 Understand how to recruit employees

3 Understand how to reward employees in order to motivate and retain them

4 Know the mechanisms for the cessation of employment.

Unit content

1 **Understand the difference between personnel management and human resource management**

The role and function of human resource management: models of personnel management– Tyson and Fell; personnel as a specialist function; personnel policies, strategies and operating plans; personnel roles and responsibilities (manager, supervisor, worker); contribution to organisational purposes

Legal and regulatory framework: the influence of relevant national and international legislation; the influence of relevant codes of practice

2 **Understand how to recruit employees**

Human resource planning: definition; reasons for; processes; limiting factors in the land-based sector; stages of planning human resources

Recruitment and selection: legislative framework; recruitment policy; recruitment procedure; job analysis and description; personnel specification; recruitment methods and media; selection methods and procedures; offers of employment; evaluation and comparison of processes

3 **Understand how to reward employees in order to motivate and retain them**

Performance appraisal: purpose of appraisal; team appraisal; individual appraisal; appraisal procedures and techniques; the appraisal interview; following up appraisals; influence on remuneration

Reward management: motivational and reward theory; purpose and methods within a land-based enterprise; factors determining pay; payment system; incentive schemes; legislative framework on pay and benefits; effectiveness of different reward systems

Discipline and grievance procedures: definition; model disciplinary procedure; ACAS code of practice; disciplinary interviews; grievance procedures; evaluating effectiveness of procedures

Human resource management information systems: personnel records and statistics; the use of statistics; computerised systems; legislative framework eg Data Protection Act (1984)

4 **Know the mechanisms for the cessation of employment**

The legal framework on employment protection: dismissal – wrongful, unfair and justified; role of industrial tribunals; impact of legal and regulatory framework

Termination of employment: reasons eg retirement, resignation, termination of contract

Exit procedures in land-based enterprises: procedure for dismissal; notice of dismissal; exit interviews; counselling and re-training; evaluation and comparison of procedures

Redundancy: definition; legislative framework; selection for redundancy; procedures for handling redundancy; dealing with redundancy – outplacement, redeployment, retraining– Learning outcomes and assessment criteria

Learning outcomes **On successful completion of this unit a learner will:**	Assessment criteria for pass **The learner can:**
LO1 Understand the difference between personnel management and human resource management	1.1 distinguish between personnel management and human resource management 1.2 assess the function of human resource management in contributing to organisational purposes 1.3 evaluate the role and responsibilities of line managers in human resource management 1.4 analyse the impact of the legal and regulatory framework on human resource management
LO2 Understand how to recruit employees	2.1 analyse the reasons for human resource planning in organisations 2.2 outline the stages involved in planning human resource requirements 2.3 compare the recruitment and selection process in two organisations 2.4 evaluate the effectiveness of the recruitment and selection techniques in two organisations
LO3 Understand how to reward employees in order to motivate and retain them	3.1 assess the link between motivational theory and reward 3.2 evaluate the process of job evaluation and other factors determining pay 3.3 assess the effectiveness of reward systems in different contexts 3.4 examine the methods organisations use to monitor employee performance
LO4 Know the mechanisms for the cessation of employment	4.1 identify the reasons for cessation of employment with an organisation 4.2 describe the employee exit procedures used by two organisations 4.3 consider the impact of the legal and regulatory framework on employment cessation arrangements

Guidance

Links

This unit links with the following units:

Unit 1: Business Environment

Unit 34: Small Business Enterprise.

Essential requirements

In order to fulfil the assessment criteria, the learners will require access to a variety of up-to-date texts, journals and papers on the principles and practices of human resource management. Learners will also require access to the current national and international legislation and codes of practice relating to all aspects of human resource management. Learners must undertake study of at least one land-based enterprise when fulfilling the assessment criteria.

Employer engagement and vocational contexts

Centres delivering this unit will need firm links with local land-based industries. Such links will enable learners to experience the working culture and practices within the sector and to identify and evaluate specific recruitment and retention issues in their local area.

Links with national and international professional bodies such as the Society of Human Resource Management and the Chartered Institute of Personnel and Development will also help learners to access current developments within the profession.