Pearson BTEC Level 4 Certificate in Healthcare Science

Specification

BTEC Professional qualifications

First teaching March 2015

Issue 2

Edexcel, BTEC and LCCI qualifications

Edexcel, BTEC and LCCI qualifications are awarded by Pearson, the UK's largest awarding body offering academic and vocational qualifications that are globally recognised and benchmarked. For further information, please visit our qualifications website at qualifications.pearson.com. Alternatively, you can get in touch with us using the details on our contact us page at qualifications.pearson.com/contactus

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This specification is Issue 2. Key changes are listed in the summary table on the next page. We will inform centres of any changes to this issue. The latest issue can be found on the Pearson website: qualifications.pearson.com

This qualification was previously known as:

Pearson BTEC Level 4 Certificate in Healthcare Science (QCF)

The QN remains the same.

References to third party material made in this specification are made in good faith. Pearson does not endorse, approve or accept responsibility for the content of materials, which may be subject to change, or any opinions expressed therein. (Material may include textbooks, journals, magazines and other publications and websites.)

All information in this specification is correct at time of publication.

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Summary of Pearson BTEC Level 4 Certificate in Healthcare Science specification Issue two changes

Summary of changes made between previous issue and this current issue	Page number
All references to QCF have been removed throughout the specification	
Definition of TQT added	1
Definition of sizes of qualifications aligned to TQT	5
TQT value added	5
QCF references removed from unit titles and unit levels in all units	16-61
Guided learning definition updated	1

Earlier issue show previous changes.

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

Purpose of this specification

The purpose of a specification as defined by Ofqual is to set out:

- the qualification's objective
- any other qualification that a learner must have completed before taking the qualification
- any prior knowledge, skills or understanding that the learner is required to have before taking the qualification
- units that a learner must have completed before the qualification will be awarded and any optional routes
- any other requirements that a learner must have satisfied before they will be assessed or before the qualification will be awarded
- the knowledge, skills and understanding that will be assessed as part of the qualification (giving a clear indication of their coverage and depth)
- the method of any assessment and any associated requirements relating to it
- the criteria against which the learner's level of attainment will be measured (such as assessment criteria)
- any specimen materials
- any specified levels of attainment.

BTEC Professional qualification titles covered by this specification

Pearson BTEC Level 4 Certificate in Healthcare Science

Qualifications eligible and funded for post-16-year-olds can be found on the funding Hub. The Skills Funding Agency also publishes a funding catalogue that lists the qualifications available for 19+ funding.

The qualification and unit codes will appear on learners' final certification documentation.

The QN for the qualification in this publication is: 601/5722/7

Pearson BTEC Level 4 Certificate in Healthcare Science

This qualification title will appear on learners' certificates. Learners need to be made aware of this when they are recruited by the centre and registered with Pearson.

Contents

What are BTEC Level 4 Professional qualifications?

BTEC Professional qualifications are qualifications at Level 4 to Level 8 and are designed to provide professional work-related qualifications in a range of sectors. They give learners the knowledge, understanding and skills that they need to prepare for employment. The qualifications also provide career development opportunities for those already in work. Consequently they provide a course of study for full-time or part-time learners in schools, colleges and training centres.

BTEC Professional qualifications provide much of the underpinning knowledge and understanding for the National Occupational Standards for the sector, where these are appropriate. They are supported by the relevant Standards Setting Body (SSB) or Sector Skills Council (SSC). A number of BTEC Professional qualifications are recognised as the knowledge components of Apprenticeship Frameworks.

On successful completion of a BTEC Professional qualification, learners can progress to or within employment and/or continue their study in the same or related vocational area.

Sizes of Specialist qualifications

For all regulated qualifications, we specify a total number of hours that learners are expected to undertake in order to complete and show achievement for the qualification – this is the Total Qualification Time (TQT). The value indicates the size of a qualification.
Within the TQT, we identify the number of Guided Learning Hours (GLH) that a centre delivering the qualification needs to provide. Guided learning means activities that directly or immediately involve tutors and assessors in teaching, supervising, and invigilating learners, for example lectures, tutorials, online instruction and supervised study.
As well as guided learning, there may be other required learning that is directed by tutors or assessors. This includes, for example, private study, preparation for assessment and undertaking assessment when not under supervision, such as preparatory reading, revision and independent research.

As well as TQT and GLH, qualifications can also have a credit value – equal to one tenth of TQT, rounded to the nearest whole number.

TQT and credit values are assigned after consultation with users of the qualifications.

BTEC Professional qualifications are available in the following sizes:

- Award – a qualification with a TQT value of 120 or less (equivalent to a range of 1–12 credits)
- Certificate – a qualification with a TQT value in the range of 121–369 (equivalent to a range of 13–36 credits)
- Diploma – a qualification with a TQT value of 370 or more (equivalent to 37 credits and above).

BTEC Level 4 Award

The BTEC Level 4 Award provides an introduction to the skills, qualities and knowledge that may be required for employment in a particular vocational sector.

BTEC Level 4 Certificate

The BTEC Level 4 Certificate extends the work-related focus from the BTEC Level 4 Award and covers some of the knowledge and practical skills required for a particular vocational sector.

The BTEC Level 4 Certificate offers an engaging programme for those who are clear about the vocational area they want to learn more about. These learners may wish to extend their programme through the study of a related GCSE, a complementary NVQ or other related vocational or personal and social development qualification. These learning programmes can be developed to allow learners to study complementary qualifications without duplication of content.

For adult learners the BTEC Level 4 Certificate can extend their knowledge and understanding of work in a particular sector. It is a suitable qualification for those wishing to change career or move into a particular area of employment following a career break.

BTEC Level 4 Diploma

The BTEC Level 4 Diploma extends the work-related focus from the BTEC Level 4 Certificate. There is potential for the qualification to prepare learners for employment in a particular vocational sector and it is suitable for those who have decided that they wish to enter a specific area of work.

Key features of the Pearson BTEC Level 4 Certificate in Healthcare Science

This qualification is aimed at healthcare science associates who will be either new recruits or existing employees. Achievement of the qualification will enable learners to progress within the workplace or progress to higher education to study to become a healthcare science practitioner.

The Pearson BTEC Level 4 Certificate in Healthcare Sciencehas been developed to give learners the opportunity to:

- engage in learning that is relevant to them and which will give them opportunities to develop a range of techniques, personal and other skills, and attributes essential for successful performance in working life
- achieve a nationally recognised Level 4 vocationally-related qualification
- progress to employment in the healthcare science sector
- progress to related general and/or vocational qualifications.

National Occupational Standards

Where relevant, BTEC Level 4 qualifications are designed to provide some of the underpinning knowledge and understanding for the National Occupational Standards (NOS), as well as developing practical skills in preparation for work and possible achievement of NVQs in due course. NOS form the basis of National Vocational Qualifications (NVQs). BTEC Level 4 qualifications do not purport to deliver occupational competence in the sector, which should be demonstrated in a work context.

Each unit in the specification identifies links to elements of the NOS in *Annexe C*.

The Pearson BTEC Level 4 Certificate in Healthcare Science relates to the following NOS:

- Healthcare
- Laboratory Science.

Rules of combination

The rules of combination specify the credits that need to be achieved, through the completion of particular units, for the qualification to be awarded. All accredited qualifications have rules of combination.

Rules of combination for BTEC Level 4 qualifications

When combining units for a Pearson BTEC Level 4 Certificate in Healthcare Science it is the centre's responsibility to ensure that the following rules of combination are adhered to.

1 Qualification credit value: a minimum of 15 credits and 150 TQT.

2 Minimum credit to be achieved at, or above, the level of the qualification: 15 credits.

3 All credits must be achieved from the units listed in this specification.

Qualification structure of the Pearson BTEC Level 4 Certificate in Healthcare Science

The Pearson BTEC Level 4 Certificate in Healthcare Science is a 15-credit, 150 TQT and 102-guided-learning-hour (GLH) qualification consisting of five mandatory units.

Pearson BTEC Level 4 Certificate in Healthcare Science			
Unit	**Units**	**Credit**	**Level**
1	Applying the Scientific Method in Healthcare Science Research	3	4
2	Working within the Legal, Ethical and Regulatory Context of Healthcare Science	4	4
3	Working in Partnership with Service Users, Colleagues and other Professionals	3	4
4	Investigating, Diagnosing, Treating and Managing Human Disease and Disorders	3	4
5	Safety, Security and Wellbeing in the Healthcare Science Environment	2	4

Assessment

All units in this qualification are internally assessed. The qualifications are criterion referenced, based on the achievement of all the specified learning outcomes.

To achieve a 'pass' a learner must have successfully passed **all** the assessment criteria.

Guidance

The purpose of assessment is to ensure that effective learning has taken place to give learners the opportunity to:

- meet the standard determined by the assessment criteria and
- achieve the learning outcomes.

All the assignments created by centres should be reliable and fit for purpose, and should be built on the unit assessment criteria. Assessment tasks and activities should enable learners to produce valid, sufficient and reliable evidence that relates directly to the specified criteria. Centres should enable learners to produce evidence in a variety of different forms, including performance observation, presentations and posters, along with projects, or time-constrained assessments.

Centres are encouraged to emphasise the practical application of the assessment criteria, providing a realistic scenario for learners to adopt, and making maximum use of practical activities. The creation of assignments that are fit for purpose is vital to achievement and their importance cannot be over-emphasised.

The assessment criteria must be clearly indicated in the assignments briefs. This gives learners focus and helps with internal verification and standardisation processes. It will also help to ensure that learner feedback is specific to the assessment criteria.

When designing assignments briefs, centres are encouraged to identify common topics and themes. A central feature of vocational assessment is that it allows for assessment to be:

- current, i.e. to reflect the most recent developments and issues
- local, i.e. to reflect the employment context of the delivering centre
- flexible to reflect learner needs, i.e. at a time and in a way that matches the learner's requirements so that they can demonstrate achievement.

All units must be assessed in line with the Cogent Assessment Strategy found in *Annexe A.*

Qualification grade

Learners who achieve the minimum eligible credit value specified by the rule of combination will achieve the qualification at pass grade.

In BTEC Level 4 Professional qualifications each unit has a credit value which specifies the number of credits that will be awarded to a learner who has achieved the learning outcomes of the unit. This has been based on:

- one credit for those learning outcomes achievable in 10 hours of learning time
- learning time being defined as the time taken by learners at the level of the unit, on average, to complete the learning outcomes of the unit to the standard determined by the assessment criteria
- the credit value of the unit remaining constant regardless of the method of assessment used or the qualification to which it contributes.

Quality assurance of centres

BTEC Level 4–7 qualifications provide a flexible structure for learners, enabling programmes of varying credits and combining different levels. For the purposes of quality assurance, all individual qualifications and units are considered as a whole.

Centres delivering BTEC Level 4–7 qualifications must be committed to ensuring the quality of the units and qualifications they deliver, through effective standardisation of assessors and verification of assessor decisions. Centre quality assurance and assessment is monitored and guaranteed by Pearson.

Pearson quality assurance processes involve:

- centre approval for those centres not already recognised as a centre for BTEC qualifications
- approval for BTEC Level 4–7 qualifications and units.

For all centres delivering BTEC qualifications at Levels 4–7, Pearson allocates a Standards Verifier (SV) for each sector offered. They will conduct an annual visit to quality assure the programmes.

Approval

Centres are required to declare their commitment to ensuring the quality of the programme of learning and to provide appropriate assessment opportunities for learners that lead to valid and accurate assessment outcomes. In addition, centres will commit to undertaking defined training and online standardisation activities.

Centres already holding approval are able to gain qualification approval online. New centres must complete a centre approval application.

Quality assurance guidance

Details of quality assurance for BTEC Level 4–7 qualifications are available on our website, qualifications.pearson.com

Programme design and delivery

Mode of delivery

Pearson does not normally define the mode of delivery BTEC Level 4 to Level 8 qualifications. Centres are free to offer the qualifications using any mode of delivery (such as full-time, part-time, evening only, distance learning) that meets their learners' needs. Whichever mode of delivery is used, centres must ensure that learners have appropriate access to the resources identified in the specification and to the subject specialists delivering the units. This is particularly important for learners studying for the qualification through open or distance learning.

Learners studying for the qualification on a part-time basis bring with them a wealth of experience that should be utilised to maximum effect by tutors and assessors. The use of assessment evidence drawn from learners' work environments should be encouraged. Those planning the programme should aim to enhance the vocational nature of the qualification by:

- liaising with employers to ensure a course relevant to learners' specific needs
- accessing and using non-confidential data and documents from learners' workplaces
- including sponsoring employers in the delivery of the programme and, where appropriate, in the assessment
- linking with company-based/workplace training programmes
- making full use of the variety of experience of work and life that learners bring to the programme.

Resources

BTEC Level 4 qualifications are designed to give learners an understanding of the skills needed for specific vocational sectors. Physical resources need to support the delivery of the programme and the assessment of the learning outcomes, and should therefore normally be of industry standard. Staff delivering programmes and conducting the assessments should be familiar with current practice and standards in the sector concerned. Centres will need to meet any specific resource requirements to gain approval from Pearson.

Where specific resources are required these have been indicated in individual units in the *Essential resources* sections.

Delivery approach

It is important that centres develop an approach to teaching and learning that supports the vocational nature of BTEC Level 4 qualifications and the mode of delivery. Specifications give a balance of practical skill development and knowledge requirements, some of which can be theoretical in nature. Tutors and assessors need to ensure that appropriate links are made between theory and practical application and that the knowledge base is applied to the sector. This requires the development of relevant and up-to-date teaching materials that allow learners to apply their learning to actual events and activity within the sector. Maximum use should be made of learners' experience.

Access and recruitment

Pearson's policy regarding access to its qualifications is that:

- they should be available to everyone who is capable of reaching the required standards
- they should be free from any barriers that restrict access and progression
- there should be equal opportunities for all wishing to access the qualifications.

Centres are required to recruit learners to BTEC qualifications with integrity. This will include ensuring that applicants have appropriate information and advice about the qualifications and that the qualification will meet their needs. Centres should take appropriate steps to assess each applicant's potential and make a professional judgement about their ability to successfully complete the programme of study and achieve the qualification. This assessment will need to take account of the support available to the learner within the centre during their programme of study and any specific support that might be necessary to allow the learner to access the assessment for the qualification. Centres should consult our policy on learners with particular requirements.

Centres will need to review the entry profile of qualifications and/or experience held by applicants, considering whether this profile shows an ability to progress to a higher-level qualification.

Access to qualifications for learners with disabilities or specific needs

Equality and fairness are central to our work. Pearson's Equality Policy requires all learners to have equal opportunity to access our qualifications and assessments. It also requires our qualifications to be awarded in a way that is fair to every learner.

We are committed to making sure that:

- learners with a protected characteristic (as defined by the Equality Act 2010) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to learners who do not share that characteristic
- all learners achieve the recognition they deserve from undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

Learners taking a qualification may be assessed in British sign language or Irish sign language where it is permitted for the purpose of reasonable adjustments.

Further information on access arrangements can be found in the Joint Council for Qualifications (JCQ) document *Access Arrangements, Reasonable Adjustments and Special Consideration for General and Vocational qualifications*.

Details on how to make adjustments for learners with protected characteristics are given in the document *Pearson Supplementary Guidance for Reasonable Adjustment and Special Consideration in Vocational Internally Assessed Units*.

Both documents are on our website, qualifications.pearson.com

Restrictions on learner entry

The Pearson BTEC Level 4 Certificate in Healthcare Science is accredited for learners aged 16 and above.

Recognising prior learning and achievement

Recognition of Prior Learning

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

Pearson encourages centres to recognise learners' previous achievements and experiences whether at work, home and at leisure, as well as in the classroom. RPL provides a route for the recognition of the achievements resulting from continuous learning.

RPL enables recognition of achievement from a range of activities using any valid assessment methodology. Provided that the assessment requirements of a given unit or qualification have been met, the use of RPL is acceptable for accrediting a unit, units or a whole qualification. Evidence of learning must be sufficient, reliable and valid.

There is further guidance in our policy document *Recognition of Prior Learning Policy and Process,* available on our website.

Unit format

Each unit has the following sections.

Unit title

This is the formal title of the unit that will appear on the learner's certificate.

Unit reference number

Each unit is assigned a unit reference number that appears with the unit title on the Register of Regulated Qualifications.

Level

All units and qualifications have a level assigned to them. The level assigned is informed by the level descriptors defined by Ofqual, the qualifications regulator.

Credit value

All units have a credit value. The minimum credit value that may be determined for a unit is one, and credits can only be awarded in whole numbers. Learners will be awarded credits for the successful completion of whole units.

Guided learning hours

Guided Learning Hours (GLH) is the number of hours that a centre delivering the qualification needs to provide. Guided learning means activities that directly or immediately involve tutors and assessors in teaching, supervising, and invigilating learners, for example lectures, tutorials, online instruction and supervised study.

Unit aim

This gives a summary of what the unit aims to do.

Learning outcomes

The learning outcomes of a unit set out what a learner knows, understands or is able to do as the result of a process of learning.

Assessment criteria

Assessment criteria specify the standard required by the learner to achieve each learning outcome.

Unit content

The unit content identifies the breadth of knowledge, skills and understanding needed to design and deliver a programme of learning to achieve each of the learning outcomes. This is informed by the underpinning knowledge and understanding requirements of the related National Occupational Standards (NOS), where relevant. The content provides the range of subject material for the programme of learning and specifies the skills, knowledge and understanding required for achievement of the unit.

Each learning outcome is stated in full and then the key phrases or concepts related to that learning outcome are listed in italics followed by the subsequent range of related topics.

Relationship between content and assessment criteria

The learner should have the opportunity to cover all of the unit content.

It is not a requirement of the unit specification that all of the content is assessed. However, the indicative content will need to be covered in a programme of learning in order for learners to be able to meet the standard determined in the assessment criteria.

Essential guidance for tutors

This section gives tutors additional guidance and amplification to aid understanding and a consistent level of delivery and assessment. It is divided into the following sections.

- *Delivery* – explains the content's relationship to the learning outcomes and offers guidance about possible approaches to delivery. This section is based on the more usual delivery modes but is not intended to rule out alternative approaches.
- *Assessment* – gives amplification about the nature and type of evidence that learners need to produce in order to achieve the unit. This section should be read in conjunction with the assessment criteria.
- *Essential resources* – identifies any specialist resources needed to allow learners to generate the evidence required for each unit. The centre will be asked to ensure that any requirements are in place when it seeks approval from Pearson to offer the qualification.
- *Suggested resources* – lists resource materials that can be used to support the teaching of the unit, for example books, journals and websites.

Units

Unit 1: Applying the Scientific Method in Healthcare Science Research

Unit reference number: F/507/0374

Level: 4

Credit value: 3

Guided learning hours: 20

Unit aim

The aim of this unit is to give learners an understanding of the use of the scientific method in healthcare science research. The unit explores the process of carrying out a literature review and developing a testable hypothesis. Learners will, through systematic data collection and analysis, formulate findings and recommendations.

Learners will apply scientific research and development principles when undertaking a mini research and development project within their work specialism. Learners will produce a report, justifying their methodology, data analysis and findings. They will also take part in activities relating to the audit and continuous improvement of service activity.

Learning outcomes and assessment criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

On completion of this unit a learner should:

Learning outcomes	Assessment criteria
1 Understand the principles of scientific research and evidence-based practice in healthcare science settings	1.1 Explain the scientific research process 1.2 Critically review the outcomes of the Caldicott Enquiry in relation to patient/participant confidentiality in healthcare science research and development 1.3 Explain the management of service users/participants wellbeing and rights in evidence-based research and development 1.4 Evaluate different research and evidence-based practice methods used in healthcare science research projects 1.5 Explain how to produce a simple testable hypothesis
2 Be able to conduct a review of literature on a topic relevant to own area of healthcare science	2.1 Carry out a review of literature on an agreed topic using appropriate sources and methods
3 Be able to participate in research and development projects to explore innovations in healthcare science	3.1 Discuss the objectives and hypothesis of a planned research and development healthcare science project 3.2 Produce a list of relevant research resources using a recognised recording protocol 3.3 Collect and collate data for the research project using a method appropriate to the nature of the research 3.4 Apply appropriate statistical techniques to analyse the data of a research project 3.5 Justify the conclusions drawn from a research project 3.6 Carry out the research activities methodically, following instructions and protocols

Learning outcomes	Assessment criteria
4 Be able to participate in audit activities in healthcare science	4.1 Analyse the principles, procedures and protocols relevant to audit activities 4.2 Apply own organisation's principles, procedures and protocols to audit activities within the relevant working context

Unit content

1 **Understand the principles of scientific research and evidence-based practice in healthcare science settings**

Scientific research process: initial question developed through systematic observation, literature review, formulation of hypothesis, designing project to test hypothesis, collaboration with colleagues, funding, data collection/experiment, measurement, data analysis, interpretation of data and conclusions, modification of hypothesis, draft paper submitted for peer review, publication and inspiration for further research

Confidentiality: exemplified by the six principles and the recommendations of the Caldicott Enquiry, Data Protection Act (1998) – eight data protection principles, role and responsibilities of the Caldicott Guardian, NHS confidentiality code of practice and legal obligations

Patients'/participants' wellbeing and rights: key principles of patient wellbeing, e.g. non-maleficence, confidentiality, valid and informed consent, ensuring understanding of service users, service users' right of refusal, legal framework, e.g. definition of valid and informed consent, mental capacity of subject, provision of sufficiency of information

Legislation: Mental Capacity Act (2005), EU Clinical Trials Directive 2004/20/EC, Medicines for Human use (Clinical Trials) Regulations (2004), Data Protection (1998), Human Tissue Act (2004)

Qualitative and quantitative research methods: evidence-based practice, choice of appropriate research methods, ethical considerations, e.g. potential vulnerability of subject group/individual, proposed use of data, potential misuse of data, data analysis

Hypothesis: formulation, testing, modification, data collection, methodology, evidence-based data, consequences of poor data collection, validity, reliability, generalisability, accuracy, precision

2 **Be able to conduct of a review of literature on a topic relevant to own area of healthcare science**

Different types of literature review: traditional/review, systematic, scholarly articles, other sources of information, comparing and contrasting different authors' views on an issue, critique of methodology used in previous research, highlighting gaps in research

Literature review process: steps in the review process (selecting a review topic, searching the literature, gathering, reading and analysing the literature, writing the review, references), search and selection strategies (databases, keyword searches, Boolean operators), sources of information (primary sources, secondary sources, conceptual/theoretical, anecdotal/opinion/clinical), appraising sources of information, preview, question, read, summarise (PQRS) system, writing the review (introduction, main body, conclusion, references)

3 **Be able to participate in research and development projects to explore innovations in healthcare science**

Objectives of planned research: e.g. highlight gaps in provision, inform policy and procedure, to extend current knowledge, improve practice, examine topics of current importance, aid reflection, allow progress to be monitored, determination of causes of, for example, diseases

Relevant research resources: journals, results of existing clinical trials and clinical research, publications by relevant bodies, e.g. The Wellcome Trust, Medical Research Council, (MRC), Biotechnology and Biological Sciences Research Council, (BBSRC), British Society for Human Genetics, (BSHG), current textbooks

Data collection: results of experiments and clinical trials, use of questionnaires, open and closed questions, focus groups, structured and unstructured interviews, internet searches

Statistical techniques: appropriate to data collection, appropriate to hypothesis, analysis and inference, use of statistical packages, e.g. SPSS, Minitab

Drawing conclusions: data analysis, summary of project and findings, main reasons/causes/other factors, hypothesis upheld or not, recommendations for future research

Research activities: action research, documentary analysis, clinical trials, observations, examination of clinical samples

4 **Be able to participate in audit activities in healthcare science**

Audit: purpose and objectives, e.g. measurement of existing practice against evidence-based clinical standards including process and outcomes, maintenance of quality assurance, detection of errors, provision of accurate evidence for regulatory bodies, principles, procedures and protocols associated with audit activities, application of own organisation's principles, procedures and protocols to audit activity

Essential guidance for tutors

Delivery

The following delivery guidance is not intended to be prescriptive. Those delivering the programme of learning can adapt the guidance to meet the needs of learners, employers and the specific context.

For **learning outcome 1**, learners will benefit from taught sessions on the various aspects of the research process. Examples of recent research will give learners an insight into current topics. Supporting learners with their preliminary internet and literature searches will help them to decide on an area of research (AC 1.1, 1.4, 1.5). Input from guest speakers on the Caldicott principles and ethical considerations in research will enhance understanding (AC 1.2, 1.3).

Internet searches to examine different research methods will give learners an understanding of how different methods best suit various research topics.

Discussion with senior colleagues on research they have undertaken and problems they have encountered and how they have been overcome, will give learners guidance on how to carry out research.

Learners could choose a topic linked to their area of work or a topic connected to their career plans. Discussion with tutors and/or workplace supervisors and mentors should take place at an early stage to ensure that the proposed research is feasible.

For **learning outcome 2**, sources of information for learners include online journals, published papers, and libraries. A short taught session on conducting a literature search will support learners in focusing on their goals. Peer interactive discussions on information found, and the accessibility of sources, will provide additional support.

Following a preliminary search, learners could be encouraged to produce an action plan with timescales to support an organised approach.

A taught session on writing the review and one-to-one tutorials to review progress will be of benefit.

For **learning outcome 3**, taught sessions on the various techniques for data gathering, will provide learners with the appropriate knowledge and understanding to begin their study.

Input from guest speakers on their research, including talking about how they overcame issues, would enhance the learning experience. Regular one-to-one tutorials to review progress and discuss issues encountered will support progress. Learners could maintain a research log to be reviewed at tutorial, detailing progress and any issues encountered and how they were managed.

Dependent on knowledge and previous experience, taught sessions on the use of statistical packages and production of graphical representations will help learners to present data appropriately.

For **learning outcome 4**, learners could discuss, with managers and mentors, audits that take place in their work area. Taught sessions on the principles and procedures of audits in healthcare science will support understanding, together with relevant internet searches (see *Suggested resources*) and interactive peer discussions in the classroom. Access to relevant policies and procedures from the learner's work area will be invaluable.

Assessment

The centre will devise and mark the assessment for this unit.

To provide evidence of achievement for **learning outcome 1**, the learner should produce a reflective report based on their participation in a basic healthcare science research and development project related to their work setting. The report needs to:

- explain the main stages in the research process of the project (AC 1.1)
- critically review the impact of the Caldicott Enquiry outcomes on the confidentiality, management and use of patient/participant information in the project (AC 1.2)
- explain how the wellbeing and rights of the patients/participants was protected during the research project (AC 1.3)
- evaluate the research methods used in the project (AC 1.4)
- explain how the hypothesis of the project was developed (AC 1.5).

Evidence to demonstrate achievement of **learning outcome 2** should come from a work-based project in which the learner produces a review of literature on a topic related to their area of work. The topic should be agreed with their assessor/tutor and line manager beforehand and the learner should be supervised throughout. The review of literature should meet generally agreed best practice principles in terms of analysis and interpretation of literature, referencing of sources of information, language, grammar, structure and presentation.

Evidence to demonstrate the achievement of **learning outcome 3** should come from a combination of observation of the learner, review of product evidence, professional discussion, reflective report and witness testimony. The learner should be observed participating in **at least one** research project. The evidence from the observation could then be supported with professional discussion and a review of any relevant product evidence, for example a list of resources, data analysis documentation. In the professional discussion, the learner could explain the recording protocols used in producing the list or resources, the process used in collecting and collating the research data and the rationale for the choice of statistical techniques used to analyse the data (AC 3.2, 3.2,, 3.4). In the reflective report, the learner should discuss the objectives of the research project and justify the conclusions drawn using the data evidence (AC 3.1 and AC 3.5). The witness testimony could be used to confirm the learner's adherence to instructions and protocols in carrying out the assigned research activities. The learner could use the reflective report to explain how they ensured that they were following protocols and instructions. The learner should be supervised throughout the assessment process.

Evidence to demonstrate the achievement of **learning outcome 4** should come from a combination of observation of the learner, professional discussion and a reflective report. The learner should be observed participating in **at least one** audit activity. The evidence from the observation could then be supported with professional discussion and a review of any relevant product evidence, for example documents produced by the learner during the audit (AC 4.2). To meet AC 4.1, the learner should produce a reflective report that analyses the relevance of the principles, procedures and protocols applied in carrying out the audit activities.

The assessment of this learning should be integrated with the assessment of learning outcome 5 in *Unit 2: Working within the Legal, Ethical and Regulatory Context of Healthcare Science* and learning outcome 2 in *Unit 4: Investigating, Diagnosing, Treating and Managing Human Disease and Disorders* to reduce the assessment burden.

Essential resources

This unit has been developed to support learners who are in employment in healthcare sciences. Physical resources need to support the delivery of the programme and the proper assessment of the learning outcomes, and should therefore be of industry standard. Staff delivering programmes and conducting the assessments should be familiar with current practice and standards in the healthcare sciences.

Learners should have access to a range of healthcare science resources, similar to those used in industry. Learners will need access to a science laboratory equipped with standard healthcare science apparatus. Learners can also find information using company annual reports and websites, journals, magazines and newspapers. Access to a range of information resources to complete investigative assignments and case studies is essential.

Suggested resources

Books

Biggs H – *Healthcare Research Ethics and Law Regulation, Review and Responsibility* (Routledge Cavendish, 2009) ISBN 9780415429177

Borgeault I, Dingwall R, de Vries R – *The Sage Handbook of Qualitative Methods in Healthcare Research* (Sage Publications Ltd, 2010) ISBN 9781446270431

Bruce N, Pope D, Stanistreet D – *Quantitative Methods for Health Research: A Practical Interactive Guide to Epidemiology and Statistics (Wiley-Blackwell, 2008)* ISBN 978-0470022757

Dancy C, Reidy J, Rowe R – *Statistics for the Health Sciences, A Non-mathematical Introduction* (Sage Publications Ltd, 2012) ISBN 9781849203364

Polgar S, Thomas S A – *Introduction to Research in the Health Sciences, 6th Edition* (Churchill Livingstone Elsevier, 2013) ISBN 9780702041945

Journals

Journal of Healthcare Engineering – available at www.multi-science.co.uk

New Scientist
A number of scientific journals are available at http://omicsonline.org/scientific-journals.php

Websites

www.acb.org.uk/whatwedo/science/audit.aspx – Association for Clinical Biochemistry and laboratory Medicine (ACB), information on science audits

www.connectingforhealth.nhs.uk/systemsandservices/infogov/caldicott – Caldicott website

www.hqip.org.uk – Healthcare Quality Improvement Partnership

www3.imperial.ac.uk – Imperial College London, information on research governance

www.nres.nhs.uk – National Research Ethics Service (NRES)

www.reading.ac.uk – University of Reading, advice and resources on how to conduct a review of literature

Unit 2: Working within the Legal, Ethical and Regulatory Context of Healthcare Science

Unit reference number: J/507/0375

Level: 4

Credit value: 4

Guided learning hours: 30

Unit aim

The aim of this unit is to give learners an understanding of the regulatory framework within which work takes place in healthcare science. Learners will investigate the regulator's remit in producing guidelines for clinical practice, including ethical considerations and legal frameworks. They will explore clinical governance and how to minimise risk, looking at monitoring, measuring and evaluation methods regularly employed to improve services within healthcare science.

Learners will assess their own responsibilities as healthcare professionals and those of their employer – these are required elements of Employee Rights and Responsibilities (ERR) from the Apprenticeship framework. Learners will provide evidence of working to industry regulations and industry codes of conduct and practice.

Learning outcomes and assessment criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

On completion of this unit a learner should:

Learning outcomes	Assessment criteria
1 Understand guidelines for clinical practice and governance in healthcare science settings	1.1 Assess the remit of regulators and quality monitors in healthcare science 1.2 Analyse the principle of clinical effectiveness 1.3 Analyse the key principles of clinical governance
2 Be able to participate in risk assessment and management processes in healthcare science settings	2.1 Evaluate the risk management processes and procedures used in healthcare science settings 2.2 Analyse own role and responsibilities for risk assessment and management in the workplace 2.3 Carry out risk assessment and management activities as directed in the context of own job role
3 Understand ethical issues and considerations in healthcare science	3.1 Analyse ethical issues and considerations associated with work in healthcare science
4 Understand employment roles and responsibilities in healthcare science	4.1 Evaluate sources of information and advice on employment rights and responsibilities 4.2 Explain employee and employer statutory rights and responsibilities under employment law 4.3 Assess the procedures and documentation used within own organisation to recognise and protect the employer/employee relationship 4.4 Evaluate the role played by own occupation within the organisation and the industry 4.5 Assess the relevance of representative bodies to own skills, trade or occupation 4.6 Analyse an issue of public concern regarding own organisation within the healthcare science industry

Learning outcomes	Assessment criteria
5 Be able to work within industry regulations and own organisation's principles of conduct and codes of practice	5.1 Analyse the impact of the key general external regulations and requirements on own work activities 5.2 Explain the organisation's principles of conduct and codes of practice related to own work role 5.3 Carry out own work activities in line with external regulations and own organisation's principles of conduct and code of practice

Unit content

1 Understand guidelines for clinical practice and governance in healthcare science setting

Clinical practice, governance: regulators, quality monitors, standards setters, principles of clinical governance, e.g. risk management, clinical audit, education training and continuing professional development, evidence-based care and effectiveness, service user and carer experience and involvement, staffing and staff management

Clinical effectiveness: definition (scope of success, including improving quality of life, daily living, social participation), importance and relevance, e.g. fundamental right to high-quality care, efficient and safe care, meeting needs of service users, measures of success, e.g. appropriateness of intervention, value for money, efficiency and safety from the perspective of service user, carers and wider community, measurement tools, e.g. service user reported outcome measures (PROMS) questionnaire

2 Be able to participate in risk assessment and management processes in healthcare science settings

Risk assessment: methods, risk management, own role and responsibilities with respect to risk assessment and management, types of risk, risk register – importance and abuse of, methods of risk control, the risk assessment process, e.g. identifying hazards, deciding who may be at risk of harm and how, evaluating risks and deciding on precautions, recording significant findings, review and update of risk assessment

3 Understand ethical issues and considerations in healthcare science

Ethical considerations: research and development, confidentiality and disclosure, service user and participant rights, service user focus and public involvement objectives (PFPI) – importance and implementation, concept of valid and informed consent, potential vulnerability of service users and participants, potential risk of abuse

4 Understand roles and responsibilities in healthcare science

Rights and responsibilities: Employment Rights Act 1966 and updates, Equality Act 2010 and updates, Health and Safety at Work Act 1974 and updates, health and safety training, equality and diversity training, confidentiality and data protection, equal opportunities, anti-discrimination, access to Work and Additional Learning Support, interaction with other specialists and professionals, relevant representative bodies and where to access information about them, good scientific practice, good technical practice

Current issues of public concern related to healthcare science: substantiation of own arguments on current issues of public concern related to healthcare science

5 Be able to work within industry regulations and own organisation's principles of conduct and codes of practice

Industry regulations: e.g. Reporting of Injuries, Diseases, and Dangerous Occurrences Regulations 1995, (RIDDOR), Control of Substances Hazardous to Health Regulations 2002, (COSHH), Medical and Healthcare Products Regulatory Guidelines (published by the Medicines and Healthcare Products Regulatory Agency (MHRA)), Institute of Biomedical Science (IBS) code of practice

Codes of practice: standards of practice, professional practice, scientific and clinical skills; code of practice for clinical biochemists/clinical pathologists and clinical biochemistry services, Royal College of Pathologists guidelines on analytical procedures, reporting urgent and abnormal results

Standard Operating Procedures (SOPs): e.g. for hazard identification, dealing with exposure to hazardous substances, disposing of sharps, disposing of clinical and biological waste, decontamination procedures

Essential guidance for tutors

Delivery

Evidence **for learning outcome 1** will be found largely in learners' own work areas. Learners could be encouraged to discuss issues with mentors and workplace supervisors. Learners will need access to relevant portfolios and online documentation relevant to their work area.

Learners cold be given additional information through taught sessions. Information should include the definition of clinical governance in healthcare science practice and tutor-led interactive discussions with peers to compare the governance in different disciplines.

For **learning outcome 2** learners will require access to risk assessment and management procedures in their own departments. Internet and literature searches will support their understanding of the relevant legislation, regulations and codes of practice. This research could be followed by tutor-led interactive discussions on how legislation, regulations and codes of practice apply to learners' work areas.

Input from guest speakers, for example local representatives of the Health and Safety Executive and Public Health England, would enhance and underpin understanding.

To provide evidence for the assessment of the learning outcome, learners should be encouraged to keep a log of their own involvement in risk assessment and management.

For **learning outcome 3**. learners will benefit from tutor-led interactive discussions on ethical considerations. Case studies from the media or from professional magazines could be used as a focus for discussion, enabling learners to express their views and clarify any misunderstandings.

Taught sessions on definitions of ethical considerations and input from representatives of service user groups will be invaluable in supporting learners to consider issues from 'both sides'. Input from a member of a relevant ethics committee would also support understanding.

Learners will need access to relevant procedures and documentation from their own work areas. Discussions with mentors and supervisors will also be useful.

For **learning outcome 4**, learners will benefit from taught sessions on various aspects of the relevant legislation. Class activities could include the application of the relevant legislation to case studies drawn from the media, followed by interactive discussions, to clarify and underpin understanding. Input from relevant representative bodies with the opportunity to ask questions will enhance experience.

Observation of workplace mentors and senior colleagues, together with maintaining a log of their scientific and technical practice, will underpin the information learners gain from class sessions and internet searches.

For **learning outcome 5**, learners will benefit from access to regulations, legislation and codes of practice in their own work area. Information could be gathered from manuals, in-house publications and discussions with managers and supervisors. Taught sessions on legislation, covering all disciplines, for example RIDDOR and COSHH, will be of benefit. This could be followed by group discussions where the content of sessions is applied to case studies and learners' own professional experience.

Assessment

The centre will devise and mark the assessment for this unit.

Assessment of **learning outcome 1** could be in the form of a work-based project on clinical practice and governance within the learner's own area of work. Learners should refer in general terms to regulators, principles of clinical governance and clinical effectiveness, referring to at least two examples of each (AC 1.1, 1.2, 1.3).

Assessment of **learning outcome 2** should include coverage of the following items: types of risk in healthcare science, the importance and potential misuse of risk registers, methods of risk assessment and risk control, roles and responsibilities in risk management. The assessment for this learning outcome should be in two parts, the first of which could be a presentation that evaluates risk management processes and procedures used within healthcare science settings in general, with reference to **at least two** processes and procedures in learners' own work areas. The presentation should include an analysis of the key principles of clinical governance in general, learners should refer to **at least two** examples from their own work areas and include analysis of their role and responsibilities for risk assessment and management in the workplace, giving at least four examples (AC 2.1, 2.2).

For the second part of the assessment, learners must keep a log of risk assessment and management activities they have carried out in their own work role. The log should be accompanied by at least two witness statements from managers or supervisors, confirming the learner's competence in the area.

Assessment of **learning outcome 3** could be in the form of a report that analyses ethical issues and considerations in general, as applied to work in healthcare science, with reference to at least the following: research and development, confidentiality and disclosure, patient and participant rights, patient focus and the importance and implementation of Public Involvement Objectives (PFPI) (AC 3.1).

Assessment of **learning outcome 4** could be in the form of an information pack to be used by new employees in the learner's own work area. The pack should refer to:

- **at least two** sources of information and advice on employment rights and responsibilities within the work area
- employee and employer statutory rights and responsibilities with reference to the Employment Rights Act 1966, Equality Act 2010 and the Health and Safety at Work Act 1974 (plus relevant updates)
- **at least two** procedures and their corresponding documents used in own organisation to recognise and protect the employer/employee relationship
- **at least two** examples of the role played by the learner's own occupation within both the organisation and the industry

- the relevance of **at least two** representative bodies to own work role
- relevance of **at least one** issue of public concern (AC 4.1, 4.2, 4.3, 4.4, 4.5, 4.6).

For **learning outcome 5**, learners could produce a report that analyses the impact of at least the following: impact of confidentiality and data protection, equal opportunities, diversity and anti-discrimination regulations and requirements on the learner's own work activities. The report should also include an explanation of at least three of the learner's organisational principles of conduct and one code of practice related to their work role (AC 5.1, 5.2).

In addition, learners should provide at least two witness statements from managers or supervisors, confirming that they have carried out their work in accordance with external regulations and their organisation's principles of conduct and code of practice (AC 5.3).Essential resources

This unit has been developed to support learners who are employed in healthcare sciences. Physical resources need to support the delivery of the programme and the proper assessment of the learning outcomes and should, therefore, be of industry standard. Staff delivering programmes and conducting the assessments should be familiar with current practice and standards in the healthcare sciences.

Learners should have access to a range of healthcare science resources, similar to those used in industry. Learners will need access to a science laboratory equipped with standard healthcare science apparatus. Learners can find information using company annual reports and websites, journals, magazines and newspapers. Access to a range of information resources to complete investigative assignments and case studies is essential.

Suggested resources

Books

Beauchamp T, Childress J F – *Principles of Biomedical Ethics*, *Seventh Edition* (Oxford University Press, 2013) ISBN 9780199924585

Williams J (Author), Vincent C (Editor) – *Clinical Risk Management, Enhancing Patient Safety*, *Second Edition* (BMJ Books, 2001) ISBN 0727913921

Journals

Health Service Journal

New Scientist

Websites

www.hqip.org.uk/assets/Guidance/GGI-HQIP-Good-Governance-Handbook-Jan-2012.pdf – this link leads to *The Good Governance Handbook* published by the Health Quality Improvement Partnership (HQIP)

www.hse.gov.uk/healthservices/arrangements.htm – information from the Health and Safety Executive on risk management

www.hse.ie/go/clinicalgovernance – this link leads to information on clinical governance from the Health and Safety Executive

www.intechopen.com/books/risk-management-for-the-future-theory-and-cases/health-technolog – information and further links on clinical governance

http://rospaworkplacesafety.com/2013/01/21/what-is-a-risk-assessment – leads to an information sheet on risk assessment

Unit 3: Working in Partnership with Service Users, Colleagues and other Professionals

Unit reference number: L/507/0376

Level: 4

Credit value: 3

Guided learning hours: 25

Unit aim

The aim of this unit is to develop an understanding of the importance of good working relationships with partners in healthcare science service delivery. The unit covers how to work effectively with colleagues and other professionals in interagency and multidisciplinary teams. Learners will apply key concepts in how to engage with and support patients and carers in their workplace. The policy and external requirements relating to collaborative and inter-professional working will be explored in relation to the working context. Learners will also provide evidence of their use of effective communication and appropriate working practices as team leaders in line with the NHS leadership model.

Finally, learners will be given guidance to develop their own career plan, so that they will be able to manage their own professional development within the healthcare science environment.

Learning outcomes and assessment criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

On completion of this unit a learner should:

Learning outcomes	Assessment criteria
1 Be able to support multidisciplinary working in healthcare science	1.1 Evaluate collaborative working practices with service providers and agencies in own healthcare science sector 1.2 Assess the importance of multidisciplinary teams to patient investigation, treatment and care 1.3 Work constructively and effectively as a member of a multidisciplinary team
2 Be able to use communication channels within National Health Service and healthcare science	2.1 Evaluate different communication channels used with service users and the public within healthcare science 2.2 Use communication channels effectively in own working practices
3 Understand the principles that guide collaborative and inter-professional working in healthcare science	3.1 Analyse the influences of external and legal requirements on collaborative and inter-professional working practices 3.2 Analyse the influences of clinical policy and principles on collaborative and inter-professional working practices
4 Understand how the interaction of healthcare science professionals contributes to patient involvement and care	4.1 Evaluate the importance of interaction among professionals in healthcare science for service user care 4.2 Assess how professional interaction in healthcare science encourages service user involvement

Learning outcomes	Assessment criteria
5 Be able to lead a team within healthcare science	5.1 Allocate daily activities to team members in line with accepted best practice and organisational procedures 5.2 Monitor work of team members following organisational procedures 5.3 Support team members to achieve given tasks and goals 5.4 Respond to requests for support from team members 5.5 Refer issues outside of personal level of authority to appropriate colleagues
6 Be able to manage own career progression within healthcare science	6.1 Evaluate sources of information and advice on own occupational training and career 6.2 Develop a career plan appropriate to own position in healthcare science sector

Unit content

1 **Be able to support multidisciplinary working in healthcare science**

Healthcare professionals and other service providers: multidisciplinary teams working practices, importance of multidisciplinary teams, interactive practice, collaborative working (learner involvement), supporting service user involvement, cross-division practices, cross-specialism practices, interactions of healthcare science professionals, contribution of healthcare science professionals to service user involvement and care

2 **Be able to use communication channels within National Health Service and healthcare science**

Communication channels: for employing institution, for profession and professional body, for wider healthcare science community, including use of technology, chain of command, written format-updating and maintaining records, publishing of articles and papers, respect for other professionals, sharing information within teams

Barriers to communication: e.g. poor infrastructure, workloads, professional resentment, language, culture

3 **Understand the principles that guide collaborative and inter-professional working in healthcare science**

Influence of: medical ethics, legislation, e.g. Data Protection Act 1998, Freedom of Information Act 2000, confidentiality, information governance, informed consent, equality and diversity, child protection, elder abuse, mental capacity/vulnerability of service users, use of chaperones, probity, fitness to practice, response to complaints by service users

4 **Understand how the interaction of healthcare science professionals contributes to patient involvement and care**

Contributions of other agencies to collaborative working: state, private, contracted, informal, voluntary, agencies, professions, services

Benefits: to service users, e.g. confidence in care and treatment, greater willingness to participate and comply, to healthcare science professionals, e.g. able to use own expertise to the full, enhanced reputation of individuals and services

5 **Be able to lead a team within healthcare science**

Team: in normal working context or work project, day-to-day routine activities of each team member specific to job role, monitoring of work, safety, quality, speed, cost, professional manner, goals, identification of support needs, methods of support suitable to individual and job role, methods of responding to requests, who to refer issues outside of personal level of authority or competence

6 **Be able to manage own career progression within healthcare science**

Career progression: Access to Work additional learning support, development routes, transferable skills opportunities

Essential guidance for tutors

Delivery

This unit will best be delivered in the context of the learner's own area of work.

For **learning outcome 1**, taught sessions on the various aspects of multidisciplinary working could be underpinned by discussions with mentors and workplace supervisors, on the various aspects of the learning outcome content. Some internet and literature research will be useful, however much of the information could be gathered in the workplace. Access to relevant documentation in the learner's workplace is essential.

For **learning outcome 2**, learners should be supported to obtain relevant information from mentors and workplace supervisors/managers. Learners will require access to relevant documentation, within confidentiality boundaries, including records which relate to their own role. Media websites will provide examples of barriers that have prevented clear communication between professionals.

Learners should also be supported in maintaining a log of attendance at multidisciplinary meetings in their own departments and with their contributions to support the assessment of criterion 2.2.

For **learning outcome 3**, learners will benefit from taught sessions and tutor-led interactive discussions with peers. Access to relevant documentation in the workplace will be of benefit, together with internet and literature searches.

Input from senior colleagues, and experts in the field of healthcare science who have been involved in partnership working, will underpin understanding of the subject.

For **learning outcome 4**, learners could conduct internet searches to obtain information on interaction between healthcare science professionals and service users. Interactive discussions with peers, supervisors and mentors will give understanding of the barriers and issues that may arise.

Learning outcome 5 is concerned with the learner's performance in their workplace. One-to one tutorials to check on progress will provide support. It is recommended that learners keep a record of relevant activities to contribute towards assessment of learning outcome 5. The record or log could be produced in class time and the final format agreed with the tutor.

For **learning outcome 6**, on-to-one discussions with learners will support the development of action and development plans. Learners should be encouraged to produce a personal SWOT analysis before embarking on a plan, in order to take a realistic perspective on personal development. Internet research and discussions with mentors and workplace supervisors will support their decisions.

Assessment

The centre will devise and mark the assessment for this unit.

Achievement of **learning outcome 1** could be through the production of a report evaluating collaboration in healthcare science, referring to **at least two examples** in the learner's workplace (AC 1.1 1.2).

Learners will also need to provide evidence of having worked constructively and effectively in the team. This evidence could be presented in the form of a reflective journal accompanied by **at least two** witness statements from senior colleagues/managers or supervisors, confirming the learner's evidence (AC 1.3).

Achievement of **learning outcome 2** could be through a presentation evaluating the use of communication channels in healthcare science (AC 2.1). This must be accompanied by evidence of the learner's contributions to **at least two** multidisciplinary team meetings in terms of:

- clarity
- relevance
- constructive comments
- willingness to compromise
- willingness to listen to the views of others
- overall professionalism.

This evidence could take the form of a reflective account and **at least two** witness statements from a senior colleague present at the meetings (AC 2.2).

Achievement of **learning outcome 3** could be through the production of a magazine article for a relevant journal or professional magazine/broadsheet newspaper. Learners would be required to include analysis of the influence of **at least one** clinical policy including its main principles, **at least one** external factor and **at least one** piece of legislation on collaborative and inter-professional working practices, in their own organisation (AC 3.1, 3.2).

To achieve **learning outcome 4,** learners could produce a report evaluating the importance of interaction among healthcare science professionals and how it encourages the involvement of service users. Learners should refer to **at least two** reasons for the importance and **at least two** examples of assessing how interaction encourages service user involvement (AC 4.1 4.2).

Achievement of **learning outcome 5** would need to be through the presentation of evidence of the learner's competence in leading a team in a normal working context (5.1–5.5). Reflective logs/journals and witness statements could form the evidence and **at least one** example for each activity stated in the assessment criteria must be presented for assessment.

For **learning outcome 6**, learners could be asked to evaluate **at least four** sources of information and advice on their occupational training and career (AC 6.1). Learners must also produce an appropriate personal career plan (AC 6.2).

Essential resources

This unit has been developed to support learners in employment in healthcare sciences. Physical resources need to support the delivery of the programme and the proper assessment of the learning outcomes, and should therefore normally be of industry standard. Staff delivering programmes and conducting the assessments should be familiar with current practice and standards in healthcare sciences.

Learners should have access to a range of healthcare science resources, similar to those used in industry. Learners will need access to a science laboratory equipped with standard healthcare science apparatus. Learners can also find information using company annual reports and websites, journals, magazines, and newspapers. Access to a range of information resources to complete investigative assignments and case studies is essential.

Suggested resources

Books

Bayliss J – *Working in a Team: A Workbook to Successful Dynamics* (Quay Books, 2009) ISBN 9781856423687

Martin P, Eldridge K, Editors – *Partnerships in Healthcare* (Quay Books, 2006) ISBN 9781856423069

Moss B – *Communication Skills in Health and Social Care* (Sage Publications Ltd, 2012) ISBN 9781446208199

Journal

Health Service Journal – available at info.hsj.co.uk/ (subscription only)

Websites

www.bbc.co.uk/news/health-20254108 – link to BBC website article on poor communication

www.nhsemployers.org/your-workforce/plan – link to NHS multidisciplinary workforce plan

www.thenhsa.co.uk/about.php – link to the Northern Health Science Alliance (NHSA)

Unit 4: Investigating, Diagnosing, Treating and Managing Human Disease and Disorders

Unit reference number: Y/5070378

Level: 4

Credit value: 3

Guided learning hours: 21

Unit aim

The aim of this unit is to develop knowledge and skills in relation to methods of investigating, treating and managing human disease and disorders. Learners will focus on their work context while ensuring that they maintain an overall awareness of the wider integrated and interactive nature of healthcare science and how it impacts on patient involvement and care. To this end, learners will show the ability to work as members of a multidisciplinary team.

Learners will investigate the range of diagnostic treatments and management services available within their own work area, show how procedures and protocols were developed and apply them in their work situation. Learners will show evidence of completing records and documentation relating to patients and processes, using standard medical terminology and clinical coding.

Learning outcomes and assessment criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

On completion of this unit a learner should:

Learning outcomes	Assessment criteria
1. Understand the range of diagnostic treatments and management services available within own working context	1.1 Assess the relevance of a range of diagnostic treatment and management services to the investigation, treatment or management of patient disease and disorder 1.1 Assess the links to services available in other healthcare science specialisms that may be involved in ongoing patient care
2 Be able to work within protocols and procedures in patient investigation, treatment or management	2.1 Explain the development of protocols and procedures in own job role 2.2 Assess the importance of protocols and procedures for patient investigation, treatment or management 2.3 Apply own organisation's protocols and procedures within own work area for activities associated with patient investigation, treatment or management

Learning outcomes	Assessment criteria
3 Be able to support protocol-driven investigations or activities associated with patient investigation, treatment or management	3.1 Assess the value of protocol-driven investigations or activities to patient investigation, treatment or management 3.2 Carry out activities to assist protocol-driven investigations or treatment/management activities in line with own organisation's expectations 3.3 Apply own organisation's protocols and requirements for hygiene and infection control related to clinical measurements 3.4 Assess the importance of correctly using clinical coding and medical terminology in contributing to good healthcare science practice 3.5 Complete associated records and documentation using standard clinical coding and medical terminology
4 Understand the use of equipment in own work area for patient investigation, treatment or management	4.1 Explain the purpose and use of a range of equipment for patient investigation, treatment or management 4.2 Assess the limitations of equipment in relation to patient investigation, treatment or management

Unit content

1 **Understand the range of diagnostic treatments and management services available within own working context**

Diagnostic treatments and management services: range of diagnostic investigations associated with learner's working context, range of treatments associated with learner's working context, range of management services associated with learner's working context, relevance of services to investigation, treatment and management of patient diseases and disorders, diseases and disorders for which services are available, other services available in other healthcare science specialisms involved with ongoing patient care, working practices to link with services available in other healthcare science specialisms involved with ongoing patient care

2 **Be able to work within protocols and procedures in patient investigation, treatment or management**

Development: procedure for development, e.g. evaluation of current techniques, consideration of need for development, application to relevant bodies, e.g. ethics committee, Human Tissue Authority, consideration of costs versus benefits to service users and services, roles and responsibilities for development, e.g. working within boundaries of own role, role of ethics committees, adherence to organisational and statutory guidelines, reporting and recording, requirements for modification, e.g. to improve efficiency, in response to new information/research, to improve safety – of operative, service user, to meet government guidelines

Use and application: associated with learner's working context, investigation into patient disease and disorder, treatment of patient disease and disorder, management of patient disease and disorder, clinical measurements, e.g. measurement of blood gases, biopsy samples, internal organs using ultrasonics and Magnetic Resonance Imaging

3 **Be able to support protocol-driven investigations or activities associated with patient investigation, treatment or management**

Protocol-driven investigations: e.g. venesection, use of ionising radiation for X-ray examination, protocols and requirements, e.g. valid consent-full understanding of service user, ensuring presence of all required equipment, adherence to manufacturer's instructions for operation of equipment, following organisational procedure and national standards for conduct of procedures

Prevention and control of infection: use of relevant personal protective equipment, (PEP), adherence to health, safety and infection control guidelines including infection prevention and control, e.g. hand washing, use of antiseptic gels, disinfection of surfaces including skin of service users where appropriate, safe disposal of sharps and clinical waste

Clinical coding and medical terminology: in keeping with the Health and Social Care Information Centre, e.g. clinical physiology 304, clinical genetics 311, use of correct terms for procedures, avoidance of anachronisms and jargon when communicating with service users, recognition of accuracy in the use of clinical coding in preventing and reducing errors and meeting national and organisational standards

Records and documentations: e.g. accurate completion of registers, accurate completion of charts and records of procedures, signing and dating records to demonstrate ownership of procedures carried out, secure storage of records including electronic data using secure passwords; relevant legislation, e.g. Data Protection Act 1998

Clinical measurements: accuracy of measurements, use of appropriate terminology, working within boundaries of own role, reporting anomalies accurately and within agreed timescales, adherence to regulations and legislation, e.g. Human Tissue Act 2004, Ionising (Medical Exposure) Regulations 2000; safe storage and disposal of samples taken for clinical measurement, e.g. blood, tissue, urine, faeces, sputum

4 **Understand the use of equipment in own work area for patient investigation, treatment or management**

Range and key types of equipment: e.g. diagnostic imaging-ultrasound, X-ray, monitoring organ function, e.g. electro-cardiogram, examination of clinical samples-electron microscopy, supporting physiological function, e.g. renal dialysis

Limitations of equipment: e.g. not detecting all relevant anomalies, not suitable for use with some service user groups, e.g. X-rays in early pregnancy, restriction of movement, e.g. renal dialysis

Essential guidance for tutors

Delivery

This unit would be most appropriately delivered in the learner's own work setting. Access to a range of equipment, protocols and procedures, will be essential in enabling learners to achieve a full understanding of the unit.

For **learning outcome 1**, learners could explore the range of diagnostic treatment and management services in their own work area. Learners could add to their existing knowledge and understanding by observing other practitioners at work and clarifying issues with managers and workplace mentors.

Internet searches and relevant work area manuals will be of use.

Input from experts in a particular field of healthcare science, or representatives of manufacturers/calibrators of equipment would enhance understanding. Visits to other areas of work in the learner's organisation would provide a wider view of the role of the healthcare scientist.

For **learning outcome 2**, learners will need to gain a thorough understanding of the protocols and procedures of their work role. Discussions with managers and mentors will be useful, together with access to relevant manuals and the opportunity to observe senior colleagues during relevant procedures.

Internet research and interactive discussions with peers and tutors will support understanding of protocols and procedures in the wider field of healthcare science.

Learners should maintain a log of their work.

For **learning outcome 3**, learners will benefit from access to handbooks/manuals of relevant protocols and procedures. Opportunities to conduct procedures under supervision will increase confidence and support the development of competence in the work area. Learners will need access to records and documentation used in the work area.

Input from specialists, for example infection control nurses and senior healthcare science practitioners, in the learner's organisation, will promote and underpin understanding of the application of relevant protocols and procedures.

Internet searches and interactive discussions with tutors, peers and colleagues, will help to clarify issues. Information on incidents reported in the media, for example the main news channels and broadsheet newspapers, will help to highlight the need to follow protocols and procedures and the potential impact of not doing so.

For **learning outcome 4**, learners could gain the required information in their organisation. Access to other areas of healthcare science in their organisation would give them a fuller understanding of the breadth of equipment available.

Internet research and discussions with colleagues and senior practitioners, will give learners a clearer understanding of the limitations of relevant equipment, particularly equipment outside the learner's own work area.

Assessment

The centre will devise and mark the assessment for this unit.

Achievement of **learning outcome 1** could be through the production of a report that should include relevant information on **at least three** diagnostic, **at least three treatment** and **at least three** management services. The report should focus on assessing the relevance of the services (AC 1.1).

The report should also assess **at least one** link to services in other healthcare science specialisms, for each of the initial services named (AC 1.2).

To achieve **learning outcome 2**, learners could produce and deliver a PowerPoint presentation that involves peer participation, explaining the development and importance of protocols and procedures in own work environment. The presentation should include reference to **at least two** procedures and **at least two** protocols and an overall assessment of the importance of protocols and procedures in healthcare science (AC 2.1, 2.2).

Learners should provide evidence of having applied protocols and procedures in their own work area. Evidence could be in the form of **at least three** witness statements from managers or supervisors and a reflective log of activities produced by the learner (AC 2.3).

Learning outcome 3 could be achieved through the production of a report. The report should include an assessment of all of the following:

- **at least three** protocol driven investigations or activities
- **at least three** examples of relevant clinical coding
- **at least three** examples of relevant medical terminology (AC 3.1, 3.4).

Learners will also need to provide evidence of having:

- carried out **at least three** activities to assist protocol-driven investigations or treatment/management activities (AC 3.2)
- applied protocols and requirements for hygiene and infection control related to clinical measurements on **at least two** occasions (AC 3.3)
- accurately completed **at least three** associated records and documents using standard clinical coding and medical terminology (AC 3.5).

Evidence could be in the form of witness statements and logs of learner activities.

Learning outcome 4 could be achieved through the production of a short report which should include information on the purpose and use of **at least three** pieces of relevant equipment (AC 4.1). Learners must assess the equipment in relation to investigation, treatment of management of service users.

Essential resources

This unit has been developed to support learners in employment in healthcare sciences. Physical resources need to support the delivery of the programme and the proper assessment of the learning outcomes, and should therefore normally be of industry standard. Staff delivering programmes and conducting the assessments should be familiar with current practice and standards in healthcare sciences.

Learners should have access to a range of healthcare science resources, similar to those used in industry. Learners will need access to a science laboratory equipped with standard healthcare science apparatus. They can also find information using company annual reports and websites, journals, magazines, and newspapers. Access to a range of information resources to complete investigative assignments and case studies is essential.

Suggested resources

Books

HSE Health services Advisory Committee – *Safe working and the prevention of infection in clinical laboratories and similar facilities* (HSE Books, 2003) ISBN 9780717625130

Weston D – *Fundamentals of Infection Prevention and Control Theory and Practice, Second Edition* (Wiley Blackwood, 2013) ISBN 9781118306659

Journal

New Scientist

Websites

www.cdc.gov/niosh/nas/mining/pdfs/Protocol%2520Checklist.pdf – link to an article on developing scientific protocols

www.cochrane.org/about-us/evidence-based-health-care – link to articles on the importance of protocols in health sciences

www.hse.gov.uk/pubns/hsis7.htm – link to a Health and Safety Executive information sheet on safe disposal of sharps

www.multi-science.co.uk/jhe.htm – link to the Journal of Health Science Engineering

www.sciencecouncil.org/content/integrated-diagnostics – a report on health science diagnostics published by the Science Council

Unit 5: Safety, Security and Wellbeing in the Healthcare Science Environment

Unit reference number: D/507/0379

Level: 4

Credit value: 2

Guided learning hours: 16

Unit aim

This unit enables learners to explore legislation, advisory body guidelines, regulations and best practice for the safe and proper use of equipment in relation to health, safety, security and wellbeing in the healthcare science workplace.

Learners will be given the opportunity to show they can apply this knowledge in the workplace by carrying out daily tasks, following relevant organisational procedures. There is a focus on defective equipment – the risks of continuing to use it and how to identify common faults and what remedial action should be taken.

Learners will gain an awareness of the legal framework governing informed consent and show evidence of having complied with these requirements where appropriate.

Learners will gain an understanding of procedures for hygiene and infection control when using healthcare science equipment for the investigation, treatment and management of patients.

Finally, learners will develop an awareness of company guidelines for infection control and show evidence of applying them in the workplace.

Learning outcomes and assessment criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

On completion of this unit a learner should:

Learning outcomes	Assessment criteria
1 Be able to work within regulations, legislation and codes of practice in the healthcare science work environment	1.1 Explain how current health and safety legislation and regulations impact on the healthcare science work environment 1.2 Apply current regulations with respect to service user safety and safe systems within the workplace 1.3 Carry out own work responsibilities in line with the requirements of relevant legislation and local and organisational health and safety guidelines 1.4 Explain how the legal framework for informed consent applies to clinical care, research, audit and teaching 1.5 Comply, where appropriate, with own organisation's requirements for informed consent
2 Be able to use equipment safely in the healthcare science work environment	2.1 Explain the regulations and current procedures governing the use of equipment found in own work setting 2.2 Assess the risks and implications of using defective equipment in own clinical practice 2.3 Use relevant equipment within manufacturer's guidelines and relevant protocols and procedures 2.4 Take remedial action for common equipment faults in line with own organisation's policy
3 Be able to control infection risks in accordance with departmental protocols	3.1 Explain organisational guidelines and protocols for hygiene and infection control 3.2 Apply own organisation's protocols for hygiene and infection control in own clinical practice

Unit content

1 Be able to work within regulations, legislation and codes of practice in the healthcare science work environment

Health and safety: biological specimen handling, Control of Substances Hazardous to Health (COSHH) Regulations, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR), radioactivity, fire safety, electrical safety, moving and handling, display screen equipment, incident reporting, infection prevention and control, informed consent, service user safety, use of equipment relevant to learner's role, risks associated with use of defective equipment

Service user safety: legislation, codes of practice, guidelines, regulations, procedures, protocols, manufacturer's instructions, best practice, principles of health and safety

Informed consent: given voluntarily (with no coercion or deceit), given by an individual who has capacity, given by an individual who has been fully informed, recognition that assumed consent is not informed consent, recognition of an individual's right to refuse consent

Legal framework: Mental Capacity Act 2005, role of the National Patient Safety Agency, (NPSA), Health and Safety at Work Act, 1974, Health and Care Professions Council Standards of Proficiency, competency standards of relevant bodies

2 Be able to use equipment safely in the healthcare science work environment

Equipment: e.g. grinding systems, band systems, light polymerisation systems, sharps, equipment using ionising radiation, e.g. X-rays

Regulations: safety standards, risks and errors associated with use of defective equipment, identification of common faults in range of equipment relevant to learner's role, remedial action to be taken with defective equipment

Remedial action: e.g. reporting and recording of faults to relevant personnel, labelling of defective equipment to prevent use, referral to manufacturer's guidelines, not attempting to amend equipment without knowledge, understanding and qualification

3 Be able to control infection risks in accordance with departmental protocols

Organisational procedures, guidelines, protocols: legislation, codes of practice, guidelines, regulations, procedures, protocols' manufacturer's instruction, best practice, principles and practice of health and safety requirements, accurate use of personal protective equipment (PPE)

Application of procedures, guidelines, protocols: in work-related activities relevant to the learner's own role, working within the learner's own work boundaries and limits of role

Essential guidance for tutors

Delivery

This unit would be best delivered within the learner's own workplace, this would enable them access relevant information and gather evidence of relevant activities for assessment. Access to health and safety manuals and Standard Operating Procedures in the workplace, is essential in supporting understanding. These documents will also be useful in providing information sources for presentation of evidence.

For **learning outcome 1**, access to the internet will allow learners to access relevant legislation, regulations and codes of practice. In addition, taught sessions, with opportunities to apply the relevant legislation, regulations and codes of practice, will enhance understanding.

In order to gather evidence for assessment of learning outcome 1, it is recommended, that learners maintain a reflective log of their work-based activities.

Input on principles of informed consent from a senior practitioner in healthcare science, would give learners a relevant insight and support professional practice.

For **learning outcome 2**, learners will benefit from access to relevant health and safety manuals. Attendance at 'in-house' health and safety training will complement delivered content. Supervised use of relevant equipment, as appropriate to the learner's own work role, will enhance their confidence and competence in preparing them for assessment. Keeping a reflective log will enable learners to review their practice. Information gathered from the internet on incidents and accidents with healthcare science equipment will reinforce the importance of the need for precautions and adherence to regulations, legislation and codes of practice.

For **learning outcome 3**, the use of taught sessions on infection risks, supported by internet and literature searches, will give learners relevant information. Input from specialists in infection prevention and control, for example infection control champions and practitioners in the learner's organisation, will support understanding. Interactive discussions with tutors and peers will help to clarify any misunderstandings. Supervised experience in the application of hygiene and infection control protocols and procedures will support learners in their preparation for assessment. Feedback from mentors and supervisors, before assessment, will build the learner's confidence.

Assessment

The centre will devise and mark the assessment for this unit.

For the achievement of **learning outcome 1**, learners could produce a report on working within legislation, regulations and codes of practice in a healthcare science environment. Learners should refer to **at least** t**wo** pieces of legislation, **at least two** sets of regulations and **at least one** code of practice. The document should include an explanation of informed consent within healthcare science, with **at least two** examples from their own work area,(AC 1.1, 1.4).

Learners must present evidence of their professional practice, including **at least two** witness statements from relevant practitioners in the learner's work department, which give evidence of having:

- applied current regulations with respect to service user safety and safe systems on **at least one occasion** (AC 1.2)
- carried out own work responsibilities in line with government legislation and organisational health and safety guidelines on **at least one occasion** (AC 1.3)
- complied with requirements for informed consent on **at least one occasion** (AC 1.5).

All of the above must be verified by the learner in the form of a reflective journal or log.

For the achievement of **learning outcome 2,** learners could deliver a presentation on relevant regulations and procedures, referring to **at least two** regulations and **at least two** procedures (AC 2.1, 2.2).

The evidence must include an assessment of the risks and implications of using defective equipment. Learners must also provide evidence, in the form of witness statements and reflective logs, of having used relevant equipment to guidelines, protocols and procedures on **at least two occasions** and having taken remedial action for **at least one** common equipment fault (AC 2.3, 2.4).

For the achievement of **learning outcome 3** learners could write a short report on guidelines and protocols for hygiene and infection control within their own organisation. The report should include reference to **at least two** guidelines and **at least two** protocols (AC 3.1).

Learners must also present evidence of having applied **at least two** protocols within their own clinical practice on **at least two** occasions. The evidence should be in the form of witness statements from supervisors and a reflective log/statement from the learner (AC 3.2).

Essential resources

This unit has been developed to support learners in employment in healthcare sciences. Physical resources need to support the delivery of the programme and the proper assessment of the learning outcomes, and should therefore normally be of industry standard. Staff delivering programmes and conducting the assessments should be familiar with current practice and standards in healthcare sciences.

Learners should have access to a range of healthcare science resources, similar to those used in industry. Learners will need access to a science laboratory equipped with standard healthcare science apparatus. Learners can also find information using company annual reports and websites, journals, magazines, and newspapers. Access to a range of information resources to complete investigative assignments and case studies is essential.

Suggested resources

Books

Health and Safety Executive – *Safe Working and the Prevention of Infection in Clinical Laboratories and Similar Facilities* (HSE Books, 2003)
ISBN 978 0 7176 2513 0

Osara E, Charles A T – *Laboratory Total Quality Management for Practitioners and Students of Medical Laboratory Science* (Author House UK, 2012)
ISBN 9781477231098

Journal

Journal of Infection Prevention – available on the Infection Protection Society's website, www.ips.uk.net

Websites

www.his.org.uk/resources-guidelines/links-useful-organisations – link to the Healthcare Infection Society and other relevant bodies

www.hse.gov.uk/biosafety/information.htm – Health and Safety Executive, information on health and safety in clinical laboratories

www.rcn.org.uk/__data/assets/pdf_file/0008/427832/004166.pdf – Royal College of Nursing – information on infection control

www.qub.ac.uk/safety-reps/sr_webpages/safety_downloads/micro_containment_labs.pdf – information on safety in laboratories

Further information and useful publications

To get in touch with us visit our 'Contact us' pages:

- Edexcel: qualifications.pearson.com/en/support/contact-us.html
- BTEC: qualifications.pearson.com/en/about-us/qualification-brands/btec.html
- Pearson Work Based Learning and Colleges: qualifications.pearson.com/en/support/support-for-you/work-based-learning.html
- books, software and online resources for UK schools and colleges: www.pearsonschoolsandfecolleges.co.uk

Key publications:

- *Adjustments for candidates with disabilities and learning difficulties – Access and Arrangements and Reasonable Adjustments, General and Vocational qualifications* (Joint Council for Qualifications (JCQ))
- *Equality Policy* (Pearson)
- *Recognition of Prior Learning Policy and Process* (Pearson)
- *UK Information Manual* (Pearson)
- *UK Quality Vocational Assurance Handbook* (Pearson).

All of these publications are available on our website.

Publications on the quality assurance of BTEC qualifications are available on our website qualifications.pearson.com

Our publications catalogue lists all the material available to support our qualifications. To access the catalogue and order publications, please go to our website.

Additional resources

If you need further learning and teaching materials to support planning and delivery for your learners, there is a wide range of BTEC resources available.

Any publisher can seek endorsement for their resources, and, if they are successful, we will list their BTEC resources on our website.

How to obtain National Occupational Standards

Please contact:

Cogent
Unit 5
Centre Park
Warrington WA1 1GG

Contact telephone: 01925 515200
Email: info@cogent-ssc.com
Website: www.cogent-ssc.com

Professional development and training

Pearson supports UK and international customers with training related to BTEC qualifications. This support is available through a choice of training options offered on our website qualifications.pearson.com

The support we offer focuses on a range of issues, such as:

- planning for the delivery of a new programme
- planning for assessment and grading
- developing effective assignments
- building your team and teamwork skills
- developing learner-centred learning and teaching approaches
- building in effective and efficient quality assurance systems.

The national programme of training we offer is on our. You can request centre-based training through the website or you can contact one of our advisers in the Training from Pearson UK team via Customer Services to discuss your training needs.

BTEC training and support for the lifetime of the qualifications

Training and networks: our training programme ranges from free introductory events through sector-specific opportunities to detailed training on all aspects of delivery, assignments and assessment. We also host some regional network events to allow you to share your experiences, ideas and best practice with other BTEC colleagues in your region.

Regional support: our team of Curriculum Development Managers and Curriculum Support Consultants, based around the country, are responsible for providing advice and support in centres. They can help you with planning and curriculum developments.

To get in touch with our dedicated support teams please visit our website.

Your Pearson support team

Whether you want to talk to a sector specialist, browse online or submit your query for an individual response, there's someone in our Pearson support team to help you whenever – and however – you need:

- Subject Advisors: find out more about our subject advisor team – immediate, reliable support from a fellow subject expert
- Ask the Expert: submit your question online to our Ask the Expert online service and we will make sure your query is handled by a subject specialist.

Annexe A

Assessment strategy

Assessment Strategy for the
Chemical, Pharmaceutical, Bioscience, Nuclear, Oil and Gas, Petroleum and Polymer Industries

2003

Approved by UK Co-ordinating Group – October 2003 Re-approved by UK Co-ordinating Group – January 2005 Re-approved by UK Co-ordinating Group – January 2007

The Sector Skills Council for science-based industries

Contents

1) Introduction

This Assessment Strategy presents a single overarching strategy for competence-based qualifications within the Cogent sector.

a. The UKCG guidance on assessment strategies requires SSCs to develop strategic guidance on the principles which Awarding Bodies shall follow when designing and implementing N/SVQs in their sectors.

b. The requirements have been brought together in this single document in order to avoid repetition and they represent a key part of the assessment process.

c. This strategy is supplemented by award-specific assessment requirements which identify appropriate forms of evidence for the particular competence being assessed.

d. This assessment strategy shall apply to all new qualification frameworks and awards submitted after approval by UKCG.

e. Awarding Bodies representing the four nations have all been involved with the development of this assessment strategy and provided supporting letters.

f. Awarding Bodies will ensure that all practices related to assessment of Cogent S/NVQs will be conducted in accordance with the codes of practice and guidelines as set out in QCA's 'NVQ Criteria and Codes of Practice' and SQA Accreditation's 'Approved Awarding Body Criteria (2007)'

g. This strategy is set out in terms of four components, each of which is given below. They are:

- requirements for mandatory use of evidence from workplace performance;
- aspects of the standards for which the use of simulation is to be permitted and design characteristics which those simulations must address;
- definitions of the occupational competence requirements of assessors and verifiers; and
- the recommended approach to external quality control.

2) Mandatory use of evidence from workplace performance

h. Unless the use of simulation is expressly permitted within the qualification or unit specific evidence requirements, evidence must demonstrate the candidate's competence in a real or realistic environment.

i. Knowledge and Understanding will be assessed via (pre-set and/or free form) questions, or by inference from performance, which cover three primary types of knowledge:

- Knowledge of facts and procedures
- Understanding of principles, concepts and underpinning procedures
- How to apply principles and procedures in specific contexts

All questions must be asked by the assessor at appropriate moments throughout the assessment process, preferably linked to observed activity and/or review of documentary evidence. The questions asked of, and answers provided by, the candidate must be recorded.

j. In England and Wales, where the candidate is undertaking an NVQ within the context of an Apprenticeship/Foundation Modern Apprenticeship for which there is no Technical Certificate component the knowledge and understanding requirements must be separately assessed, recorded and evidenced. This must be done through the use of written question and answer evidence which is externally verified by the relevant Awarding Body. Alternative arrangements can be made for those candidates with special needs where appropriate. Examples of these Apprenticeships are L2 Apprenticeships/Foundation Modern Apprenticeship in Radiation Protection, Signmaking and Polymer Processing.

3) Use of Simulation

k. The qualification or unit specific assessment requirements will define where evidence from simulation is acceptable, and in which contexts. A full summary of these requirements for existing N/SVQs can be found in Appendix A.

l. Simulation, where permissible, may be used to provide evidence in two different scenarios: Scenario 1 – (applicable to any competence related qualifications, including N/SVQs) in order to demonstrate particular competences/units that would be difficult or dangerous to demonstrate directly Scenario 2 – (only applicable to NVQs) in order to demonstrate the acquisition of knowledge and skills where the achievement of a competence based qualification is not possible (e.g. as the basis for year 1 of an Advanced/Modern Apprenticeship – England and Wales only). This qualification would be Process Engineering Maintenance L2.

m. Scenario 1 -Where simulation is used to demonstrate particular competences/units that would be difficult or dangerous to demonstrate directly (e.g. in dealing with emergencies).

N.B. This scenario is applicable to any competence related qualifications, including N/SVQs.

Simulation should be used only where direct evidence of candidate performance cannot be obtained. Under these circumstances simulation may be used for summative assessment. Reasons for the use of simulation should be made clear to and agreed by the external verifier and should include the following details:

- which competence (and standards) the simulation was designed to assess;
- the kind of equipment, facilities and physical environment proposed for the simulation of performance. It is unlikely that the External Verifier will approve a simulation if it does not involve real plant and equipment;
- how the simulated activity relates to the candidate's normal work context in terms of the pressures of time, access to resources and access to information, and the communication media; and
- how the simulation was set up and conducted, preferably supported by physical evidence such as photographs or inspection of a test rig.

Assessors, internal verifiers and external verifiers should monitor the proportion of evidence generated via simulations to ensure that it is not the primary source of a candidate's claim to competence.

n. Under these circumstances simulations are reserved for aspects of competence illustrated by the following contexts:

- where demonstration of emergency shutdown and related safety procedures would be; **dangerous and/or disruptive** to plant/environment/individuals; **too costly** such as total plant shutdown or dealing with spillage of dangerous substances; where **issues of confidentiality** restrict access to real work opportunities;
- demonstrating specific aspects of the operation which rarely or never occur due to effective QA systems;
- the capacity to integrate disparate knowledge to cope with unforeseen events and to solve problems; or
- aspects of working relationships and communications for which no opportunity has presented for the use of naturally occurring workplace evidence of candidate performance.

o. Simulation must enable the individual to demonstrate competence in a real or realistic work environment. In this context this means in specialist centres which replicate the workplace in terms of equipment and environment, reflect normal working situations and use relevant industrial or commercial standards and procedures. Short work placements or non-realistic work environments which do not replicate the pressures and requirements of normal commercial or industrial activities will not be acceptable. The bulk of the candidate's evidence should be drawn from their normal working activity and not consist of artificially contrived opportunities for one-off demonstration of competence. Similarly equipment must be that used in current commercial and industrial contexts. Procedures and standards used should be those which are nationally or internationally recognised or devised by specific companies as standard operating procedure.

p. Scenario 2 – Where simulation is used to demonstrate the acquisition of knowledge and skills where the achievement of a competence based qualification is not possible. In England and Wales, an apprentice who is registered on a Cogent Advanced Apprenticeship/Modern Apprenticeship may use simulation on the NVQ L2 Process Engineering Maintenance as part of the basic apprenticeship training. For any person completing this qualification that fails to complete the Advanced Apprenticeship/Modern Apprenticeship it will state on their completion certificate that this qualification was assessed in a simulated environment.

The development of the Cogent 'Community Apprenticeship' model has highlighted the need to make NVQ L2 Process Engineering Maintenance available for completion through a college or other training provider 'off-site'. This is to enable the candidate to begin acquiring the skills and knowledge required to work in the Cogent industries prior to undertaking the NVQ level 3 with an employer in the normal way. Under these circumstances simulation may be used, with the prior agreement of the External Verifier, for summative assessment across the whole qualification.

q. Simulation must enable the individual to acquire his/her skills and knowledge in a realistic work environment. In this context this means in specialist centres which replicate the workplace in terms of equipment and environment, it reflects normal working situations and uses relevant industrial or commercial standards and procedures. Where possible providers should attempt to replicate the pressures and requirements of normal commercial or industrial activities. Equipment must be that used in current commercial and industrial contexts. Procedures and standards used should be those which are nationally or internationally recognised or devised by specific companies as standard operating procedure.

r. Circumstances outside of scenarios 1 and 2 above may also be considered suitable for the use of simulation with the agreement of the External Verifier, Awarding Body and Sector Skills Council. Under these circumstances simulation may be used for formative assessment only.

4) Occupational competence of assessor and verifiers

s. Assessors:

- must be competent in the units they are assessing. This is shown through the assessor having achieved the award they are assessing OR providing quality evidence to the external verifier that they are able to make valid judgements of the competence of candidates. This could be done through a combination of a) personal interview, b) review of employment histories and/or c) examination of the assessor's judgement during assessments.
- must have a working knowledge of awards and a full understanding of that part of the award for which they have responsibility.
- should hold or be working towards suitable qualifications for assessment, as defined by the Qualification Regulator(s). Organisations should consult with the relevant awarding organisation regarding approval for exemptions.

t. Internal verifiers:

- must be either working in the appropriate sector itself OR they must be able to demonstrate they possess practical and up-to-date knowledge of current working practices appropriate to the sector in which they are carrying out verification practices; and
- must be appointed by an approved centre
- must have a working knowledge of the awards they are internally verifying
- should hold or be working towards suitable qualifications for verification, as defined by the Qualification Regulator(s). Organisations should consult with the relevant awarding organisation regarding approval for exemptions.

u. External Verifiers:

- must be familiar with the industry, and have an understanding of the technical processes and terminology used. The Awarding Body, through examination of relevant CV's and references, will confirm this.
- should hold or be working towards suitable qualifications for verification, as defined by the Qualification Regulator(s).

5) External Quality Control

v. The external quality control of assessment is to be ensured, in this highly regulated and safety-critical sector, through the use of competent external verifiers.

w. External quality control will be undertaken by one of two methods to be selected at the choice of the Awarding Body. These are:

- Statistical Monitoring in which the risk rating of centres is determined through the collection of a range data types. Awarding Bodies delivering the awards should provide arrangements for fulfilling these requirements.

  OR

- Enhanced External Verification in which one critical unit (identified by the standards-setting body) is to be sampled at all external verification events. Where there have been no candidates assessed in a centre for this unit, the external verifier will duly record this fact. This enhanced external verification model will cover the evidence assessed by each assessor involved in the assessment of the safety-critical unit over a twelve month period.

Annexe B

The Pearson/BTEC qualification framework for the healthcare sector

Progression opportunities within the framework.

Level	General qualifications	BTEC full vocationally-related qualifications	BTEC professional/ specialist courses	NVQ/occupational
5		Pearson BTEC Level 5 HNC Diploma in Health and Social Care		Pearson Edexcel Level 5 Diploma in Leadership for Health and Social Care and Children's Services for England Pearson Edexcel Level 5 Diploma in Leadership for Health and Social Care Services (Adult Advanced Practice) Wales and Northern Ireland Pearson Edexcel Level 5 Diploma in Leadership for Health and Social Care Services (Adults' Management) Wales and Northern Ireland Pearson Edexcel Level 5 Diploma in Leadership for Health and Social Care Services (Children and Young People's Residential Management) Wales and Northern Ireland

Level	General qualifications	BTEC full vocationally-related qualifications	BTEC professional/ specialist courses	NVQ/occupational
5				Pearson Edexcel Level 5 Diploma in Leadership for Health and Social Care Services (Adults' Residential Management) Wales and Northern Ireland Pearson Edexcel Level 5 Diploma in Leadership for Health and Social Care Services (Children and Young People's Advanced Practice) Wales and Northern Ireland Pearson Edexcel Level 5 Diploma in Leadership for Health and Social Care Services (Children and Young People's Residential Management) Wales
4		Pearson BTEC Level 4 HNC Diploma in Health and Social Care		
3	GCE Health and Social Care Higher Diploma in Society, Health and Development	Pearson Edexcel BTEC Level 3 Certificate, Subsidiary Diploma, Diploma and Extended Diploma in Health and Social Care	Pearson BTEC Level 3 Certificate in Preparing to Work in Adult Social Care	Level 3 Diploma in Health and Social Care (Adults) for England Level 3 Diploma in Health and Social Care (Adults) for Wales and Northern Ireland Level 3 Diploma in Health and Social Care (Children and Young People) for Wales and Northern Ireland

Level	General qualifications	BTEC full vocationally-related qualifications	BTEC professional/ specialist courses	NVQ/occupational
2	GCSE (Double and Single Award) in Health and Social Care Advanced Diploma in Society, Health and Development Foundation Diploma in Society, Health and Development	Pearson Edexcel BTEC Level 2 Certificate, Extended Certificate and Diploma in Health and Social Care	Pearson BTEC Level 2 Certificate in Preparing to Work in Adult Social Care Pearson BTEC Level 2 Award in Awareness of Dementia Pearson BTEC Level 2 Certificate in Dementia Care Pearson BTEC Level 2 Certificate in Supporting Individuals with Learning Disabilities	Level 2 Diploma in Health and Social Care (Adults) for England Level 2 Diploma in Health and Social Care (Adults) for Wales and Northern Ireland
1		Pearson BTEC Level 1 Award/Certificate/Diploma in Health and Social Care		
Entry		Pearson Entry Level Award in Health and Social Care (Entry 3)		

Annexe C

Personal, Learning and Thinking Skills mapping

PLTS / Units	1 L4	2 L4	3 L4	4 L4	5 L4
Independent Enquirers					
1 identify questions to answer and problems to resolve	3			3	
2 plan and carry out research, appreciating the consequences of decisions	3			3	
3 explore issues, events or problems from different perspectives	3			3	
4 analyse and evaluate information, judging its relevance and value	3			3	
5 consider the influence of circumstances, beliefs and feelings on decisions and events	3			3	
6 support conclusions, using reasoned arguments and evidence	3			3	
Creative Thinkers					
1 generate ideas and explore possibilities	3			3	
2 ask questions to extend their thinking	3			3	
3 connect their own and others' ideas and experiences in inventive ways	3			3	
4 question their own and others' assumptions	3			3	
5 try out alternatives or new solutions and follow ideas through	3			3	
6 adapt ideas as circumstances change	3			3	
Reflective Learners					
1 assess themselves and others, identifying opportunities and achievements		3	3		
2 set goals with success criteria for their development and work		3	3		
3 review progress, acting on the outcomes		3	3		
4 invite feedback and deal positively with praise, setbacks and criticism		3	3		
5 evaluate experiences and learning to inform future progress		3	3		
6 communicate their learning in relevant ways for different audiences		3	3		
Team Workers					
1 collaborate with others to work towards common goals			3		3
2 reach agreements, managing discussions to achieve results			3		3
3 adapt behaviour to suit different roles and situations, including leadership roles			3		3
4 show fairness and consideration to others			3		3
5 take responsibility, showing confidence in themselves and their contribution			3		3
6 provide constructive support and feedback to others			3		3
Self-Managers					
1 seek out challenges or new responsibilities and show flexibility when priorities change				3	3
2 work towards goals, showing initiative, commitment and perseverance				3	3
3 organise time and resources, prioritising actions				3	3
4 anticipate, take and manage risks				3	3
5 deal with competing pressures, including personal and work-related demands				3	3
6 respond positively to change, seeking advice and support when needed				3	3
7 manage their emotions, and build and maintain relationships				3	3
Effective Participators					
1 discuss issues of concern, seeking resolution where needed			3		3
2 present a persuasive case for action			3		3
3 propose practical ways forward, breaking these down into manageable steps			3		3
4 identify improvements that would benefit others as well as themselves			3		3
5 try to influence others, negotiating and balancing diverse views to reach workable solutions			3		3
6 act as an advocate for views and beliefs that may differ from their own			3		3

Annexe D

Wider curriculum mapping

BTEC Level 4 qualifications give learners opportunities to develop an understanding of spiritual, moral, ethical, social and cultural issues as well as an awareness of citizenship, environmental issues, European developments, health and safety considerations and equal opportunities issues.

Spiritual, moral, ethical, social and cultural issues

Throughout the delivery of these qualifications learners will have the opportunity to actively participate in different kinds of decision making. They will have to consider fair and unfair situations and explore how to resolve conflict. Working in small groups they will learn how to respect and value others' beliefs, backgrounds and traditions.

Citizenship

Learners undertaking these qualifications will have the opportunity to develop their understanding of citizenship issues.

Environmental issues

Developing a responsible attitude towards the care of the environment is an integral part of this qualification. Learners are encouraged to minimise waste and discuss controversial issues.

European developments

Much of the content of the qualification applies throughout Europe, even though the delivery is in a UK context.

Health and safety considerations

Health and safety is embedded within many of the units in this qualification. Learners will consider their own health and safety at work, how to identify risks and hazards and how to minimise those risks.

Equal opportunities issues

There will be opportunities throughout this qualification to explore different kinds of rights and how these affect both individuals and communities, for example learners will consider their rights at work and the rights of employers and how these rights affect the work community.

Annexe E

BTEC Specialist and Professional qualifications

BTEC qualifications on the NQF	Level	BTEC Specialist and Professional qualifications	BTEC qualification suites
BTEC Level 7 Advanced Professional qualifications BTEC Advanced Professional Award, Certificate and Diploma	**7**	**BTEC Level 7 Professional qualifications** BTEC Level 7 Award, Certificate, Extended Certificate and Diploma	
BTEC Level 6 Professional qualifications BTEC Professional Award, Certificate and Diploma	**6**	**BTEC Level 6 Professional qualifications** BTEC Level 6 Award, Certificate, Extended Certificate and Diploma	
BTEC Level 5 Professional qualifications BTEC Professional Award, Certificate and Diploma	**5**	**BTEC Level 5 Professional qualifications** BTEC Level 5 Award, Certificate, Extended Certificate and Diploma	**BTEC Level 5 Higher Nationals** BTEC Level 5 HND Diploma
BTEC Level 4 Professional qualifications BTEC Professional Award, Certificate and Diploma	**4**	**BTEC Level 4 Professional qualifications** BTEC Level 4 Award, Certificate, Extended Certificate and Diploma	**BTEC Level 4 Higher Nationals** BTEC Level 4 HNC Diploma
BTEC Level 3 qualifications BTEC Award, Certificate, Extended Certificate and Diploma	**3**	**BTEC Level 3 Specialist qualifications** BTEC Level 3 Award, Certificate, Extended Certificate and Diploma	**BTEC Level 3 Nationals** BTEC Level 3 Certificate, Subsidiary Diploma, Diploma and Extended Diploma

BTEC qualifications on the NQF	Level	BTEC Specialist and Professional qualifications	BTEC qualification suites
BTEC Level 2 qualifications BTEC Award, Certificate, Extended Certificate and Diploma	**2**	**BTEC Level 2 Specialist qualifications** BTEC Level 2 Award, Certificate, Extended Certificate and Diploma	**BTEC Level 2 Firsts** BTEC Level 2 Certificate, Extended Certificate and Diploma
BTEC Level 1 qualifications BTEC Award, Certificate, Extended Certificate and Diploma	**1**	**BTEC Level 1 Specialist qualifications** BTEC Level 1 Award, Certificate, Extended Certificate and Diploma	**BTEC Level 1 qualifications** BTEC Level 1 Award, Certificate and Diploma (vocational component of Foundation Learning)
	E	**BTEC Entry Level Specialist qualifications** BTEC Entry Level Award, Certificate, Extended Certificate and Diploma	**BTEC Entry Level qualifications (E3)** BTEC Entry Level 3 Award, Certificate and Diploma (vocational component of Foundation Learning)

NQF = National Qualifications Framework

Qualification sizes	
Award	1–12 credits
Certificate	13–36 credits
Diploma	37+ credits

June 2017

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