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Specification

BTEC Specialist qualifications

Edexcel BTEC Level 3 Award/Certificate/Diploma in Engineering (Specialist: Electrical/Mechanical) (QCF)

Supplementary information

For first teaching September 2010

A PEARSON COMPANY

Edexcel, a Pearson company, is the UK's largest awarding body, offering academic and vocational qualifications and testing to more than 25,000 schools, colleges, employers and other places of learning in the UK and in over 100 countries worldwide. Qualifications include GCSE, AS and A Level, NVQ and our BTEC suite of vocational qualifications from entry level to BTEC Higher National Diplomas, recognised by employers and higher education institutions worldwide.

We deliver 9.4 million exam scripts each year, with more than 90% of exam papers marked onscreen annually. As part of Pearson, Edexcel continues to invest in cutting-edge technology that has revolutionised the examinations and assessment system. This includes the ability to provide detailed performance data to teachers and students which helps to raise attainment.

References to third party material made in this specification are made in good faith. Edexcel 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.)

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Edexcel BTEC Specialist qualification titles covered by this specification

Edexcel BTEC Level 3 Award in Engineering (Specialist: Electrical/Mechanical) (QCF)

Edexcel BTEC Level 3 Certificate in Engineering (Specialist: Electrical/Mechanical) (QCF)

Edexcel BTEC Level 3 Diploma in Engineering (Specialist: Electrical/Mechanical) (QCF)

These qualifications have been accredited to the Qualifications and Credit Framework (QCF) and are eligible for public funding as determined by the Department for Education (DfE) under Sections 96 and 97 of the Learning and Skills Act 2000.

The qualification titles listed above feature in the funding lists published annually by the DfE and the regularly updated website www.education.gov.uk/. The QCF Qualifications Accreditation Number (QAN) should be used by centres when they wish to seek public funding for their learners. Each unit within a qualification will also have a QCF unit code.

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

The Qualification Accreditation Numbers for the qualifications in this publication are:

Edexcel BTEC Level 3 Award in Engineering (Specialist: Electrical/Mechanical) (QCF)	500/8194/9
Edexcel BTEC Level 3 Certificate in Engineering (Specialist: Electrical/Mechanical) (QCF)	500/8162/7
Edexcel BTEC Level 3 Diploma in Engineering (Specialist: Electrical/Mechanical) (QCF)	500/8204/8

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

These qualifications are accredited by Ofqual as being Additional and Specialist Learning within 14-19 Diplomas.

Welcome to the Edexcel BTEC Level 3 Award/ Certificate/Diploma in Engineering (Specialist: Electrical/Mechanical) (QCF)

We are delighted to introduce our new qualifications, which will be available for teaching from September 2010. These qualifications have been revised and conform with the requirements of the new QCF (Qualifications and Credit Framework).

Focusing on the Edexcel BTEC Level 3 Award/Certificate/Diploma in Engineering (Specialist: Electrical/Mechanical) (QCF)

These qualifications, in order to meet the specific needs of learners, employers or higher education institutions, can be used as both stand alone or perhaps alongside the Diploma as ASL across a range of sectors. These qualifications offer broad progression opportunities meeting individual needs, interests and aspirations. The sector specific nature of these qualifications will also enable learners to gain a more in-depth knowledge of a chosen sector.

Straightforward to implement, teach and assess

Implementing BTECs couldn't be easier. They are designed to easily fit into your curriculum and can be studied independently or alongside existing qualifications, to suit the interests and aspirations of learners. The clarity of assessment makes grading learner attainment simpler.

Engaging for everyone

Learners of all abilities flourish when they can apply their own knowledge, skills and enthusiasm to a subject. BTEC qualifications make explicit the link between theoretical learning and the world of work by giving learners the opportunity to apply their research, skills and knowledge to work-related contexts and case studies. These applied and practical BTEC approaches give all learners the impetus they need to achieve and the skills they require for workplace or education progression.

Recognition

BTECs are understood and recognised by a large number of organisations in a wide range of sectors. BTEC qualifications are developed with key industry representatives and Sector Skills Councils (SSC) to ensure that they meet employer and learner needs — **in this case the Sector Skills Council for Science, Engineering and Manufacturing Technologies (Semta).** Many industry and professional bodies offer successful BTEC learners exemptions for their own accredited qualifications.

All you need to get started

To help you off to a flying start, we've developed an enhanced specification that gives you all the information you need to start teaching BTEC. This includes:

- a framework of equivalencies, so you can see how these qualifications compare with other Edexcel vocational qualifications
- information on rules of combination, structures and quality assurance, so you can deliver the qualification with confidence
- explanations of the content's relationship with the learning outcomes
- guidance on assessment, and what the learner must produce to achieve the unit.

Don't forget that we're always here to offer curriculum and qualification updates, local training and network opportunities, advice, guidance and support.

Contents

What are BTEC Level 3 Specialist qualifications?

BTEC Specialist qualifications are qualifications at Entry Level to Level 3 in the Qualifications and Credit Framework (QCF) and are designed to provide specialist 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 Specialist 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 Specialist qualifications are recognised as the knowledge components of Apprenticeships Frameworks.

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

Care needs to be exercised when registering learners as the titling conventions and titles for the revised QCF versions of the BTEC Level 2 Firsts and BTEC Level 3 Nationals have changed.

The QCF is a framework which awards credit for qualifications and units and aims to present qualifications in a way that is easy to understand and measure. It enables learners to gain qualifications at their own pace along flexible routes.

There are three sizes of qualifications in the QCF:

- Award (1 to 12 credits)
- Certificate (13 to 36 credits)
- Diploma (37 credits and above).

Every unit and qualification in the framework will have a credit value.

The credit value of a unit specifies the number of credits that will be awarded to a learner who has achieved the learning outcomes of the unit.

The credit value of a unit is based on:

- one credit for those learning outcomes achievable in 10 hours of learning
- learning time – 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 will remain constant in all contexts, regardless of the assessment method used for the qualification(s) to which it contributes.

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Edexcel BTEC Level 3 Award

The Edexcel BTEC Level 3 Award provides an introduction to the skills, qualities and knowledge that may be required for employment in a particular vocational sector.

Edexcel BTEC Level 3 Certificate

The Edexcel BTEC Level 3 Certificate extends the work-related focus from the Edexcel BTEC Level 3 Award and covers some of the knowledge and practical skills required for a particular vocational sector.

The Edexcel BTEC Level 3 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 Edexcel BTEC Level 3 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.

Edexcel BTEC Level 3 Diploma

The Edexcel BTEC Level 3 Diploma extends the work-related focus from the Edexcel BTEC Level 3 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 Edexcel BTEC Level 3 qualifications in Engineering (Specialist: Electrical/Mechanical) (QCF)

The Edexcel BTEC Level 3 qualifications in Engineering (Specialist: Electrical/Mechanical) (QCF) listed below have been developed to give learners the opportunity to:

- gain a qualification that is an additional specialist learning component of a Diploma
- develop specialist skills in electrical/mechanical engineering in the engineering sector
- achieve a stand alone qualification in electrical/mechanical engineering in the engineering sector
- achieve a nationally recognised Level 3 vocationally-related qualification
- progress to related general and/or vocational qualifications
- engage in learning that is relevant to them and which will provide opportunities to develop a range of skills and techniques, personal skills and attributes essential for successful performance in working life.

National Occupational Standards

Where relevant, Edexcel BTEC Level 3 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). Edexcel BTEC Level 3 (QCF) qualifications do not purport to deliver occupational competence in the sector, which should be demonstrated in a work context.

The Edexcel BTEC Level 3 Award/Certificate/Diploma in Engineering (Specialist: Electrical/Mechanical) (QCF) relates to the following NOS:

Semta Level 3 National Occupational Standards in Engineering Maintenance

Semta Level 3 National Occupational Standards in Engineering Technical Support

Semta Level 3 National Occupational Standards in Installation and Commissioning

Semta Level 3 National Occupational Standards in Electrical and Electronic Engineering

Semta Level 3 National Occupational Standards in Electrical and Electronic Servicing

Semta Level 3 National Occupational Standards in Engineering Leadership

Semta Level 3 National Occupational Standards in Engineering Materials Processing and Finishing.

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 within the QCF have rules of combination.

Rules of combination for the Edexcel BTEC Level 3 qualifications

When combining units for a Edexcel BTEC Level 3 qualification in Engineering (Specialist: Electrical/Mechanical) (QCF) listed below, it is the centre's responsibility to ensure that the following rules of combination are adhered to.

Edexcel BTEC Level 3 Award in Engineering (Specialist: Electrical/Mechanical) (QCF)

1 Qualification credit value: a minimum of 10 credits.

2 Minimum credit to be achieved at, or above, the level of the qualification: 10 credits.

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

Edexcel BTEC Level 3 Certificate in Engineering (Specialist: Electrical/Mechanical) (QCF)

1 Qualification credit value: a minimum of 30 credits.

2 Minimum credit to be achieved at, or above, the level of the qualification: 30 credits.

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

Edexcel BTEC Level 3 Diploma in Engineering (Specialist: Electrical/Mechanical) (QCF)

1 Qualification credit value: a minimum of 60 credits.

2 Minimum credit to be achieved at, or above, the level of the qualification: 60 credits.

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

Edexcel BTEC Level 3 Award in Engineering (Specialist: Electrical/Mechanical) (QCF)

The Edexcel BTEC Level 3 Award in Engineering (Specialist: Electrical/Mechanical) (QCF) is a 10 credit and 60 guided learning hours (GLH) qualification that consists of optional units that provide for a combined total of 10 credits.

Edexcel BTEC Level 3 Award in Engineering (Specialist: Electrical/Mechanical) (QCF)				
Unit code	**Optional units**	**Credit**	**GLH**	**Level**
D/600/0262	Applications of Mechanical Systems in Engineering	10	60	3
H/600/0263	Principles and Applications of Fluid Mechanics	10	60	3
T/600/0185	Principles and Applications of Thermodynamics	10	60	3
K/600/0264	Electro, Pneumatic and Hydraulic Systems and Devices	10	60	3
F/600/0268	Advanced Mechanical Principles and Applications	10	60	3
M/600/0301	Mechanical and Thermal Treatment of Metals	10	60	3
T/600/0302	Structure and Properties of Metals	10	60	3
K/600/0300	Principles and Applications of Electronic Devices and Circuits	10	60	3
Y/600/0373	Electronic Measurement and Testing	10	60	3
M/600/0346	Monitoring and Analysing Engineering Activities	10	60	3
K/600/6744	Principles and Applications of Analogue Electronics	10	60	3
A/600/6747	Construction and Applications of Digital Systems	10	60	3
D/600/0276	Selecting and Using Programmable Controllers	10	60	3
Y/600/7114	Microprocessor Systems and Applications	10	60	3
T/600/7119	Principles and Applications of Microcontrollers	10	60	3
F/600/6751	Electronic Fault-finding	10	60	3
R/600/0341	Electrical Technology	10	60	3
Y/600/0342	Electrical Installation	10	60	3
H/600/7116	Principles and Operation of Three-phase Systems	10	60	3
K/600/7117	Three-phase Motors and Drives	10	60	3
Y/600/7226	Further Electrical Principles	10	60	3

Note: The units in this qualification are drawn from the qualifications below without any change as noted in the table.

Source specification	QAN
Edexcel BTEC Level 3 Extended Diploma in Electrical/Electronic Engineering (QCF)	500/8097/0
Edexcel BTEC Level 3 Extended Diploma in Mechanical Engineering (QCF)	500/7296/1

Note: References to page numbers and links to other units within any of the above units relate to the source specifications and not this qualification.

For further information about these units, please refer to the Register of Regulated Qualifications (www.ofqual.gov.uk) or to the National Database of Accredited Qualifications (www.accreditedqualifications.org.uk).

Edexcel BTEC Level 3 Certificate in Engineering (Specialist: Electrical/ Mechanical) (QCF)

The Edexcel BTEC Level 3 Certificate in Engineering (Specialist: Electrical/Mechanical) (QCF) is a 30 credit and 180 guided learning hour (GLH) qualification that consists of optional units that provide for a combined total of 30 credits.

Edexcel BTEC Level 3 Certificate in Engineering (Specialist: Electrical/ Mechanical) (QCF)				
Unit code	**Optional units**	**Credit**	**GLH**	**Level**
D/600/0262	Applications of Mechanical Systems in Engineering	10	60	3
H/600/0263	Principles and Applications of Fluid Mechanics	10	60	3
T/600/0185	Principles and Applications of Thermodynamics	10	60	3
K/600/0264	Electro, Pneumatic and Hydraulic Systems and Devices	10	60	3
F/600/0268	Advanced Mechanical Principles and Applications	10	60	3
M/600/0301	Mechanical and Thermal Treatment of Metals	10	60	3
T/600/0302	Structure and Properties of Metals	10	60	3
K/600/0300	Principles and Applications of Electronic Devices and Circuits	10	60	3
Y/600/0373	Electronic Measurement and Testing	10	60	3
M/600/0346	Monitoring and Analysing Engineering Activities	10	60	3
K/600/6744	Principles and Applications of Analogue Electronics	10	60	3
A/600/6747	Construction and Applications of Digital Systems	10	60	3
D/600/0276	Selecting and Using Programmable Controllers	10	60	3
Y/600/7114	Microprocessor Systems and Applications	10	60	3
T/600/7119	Principles and Applications of Microcontrollers	10	60	3
F/600/6751	Electronic Fault-finding	10	60	3
R/600/0341	Electrical Technology	10	60	3
Y/600/0342	Electrical Installation	10	60	3
H/600/7116	Principles and Operation of Three-phase Systems	10	60	3
K/600/7117	Three-phase Motors and Drives	10	60	3
Y/600/7226	Further Electrical Principles	10	60	3

Note: The units in this qualification are drawn from the qualifications below without any change as noted in the table.

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Note: References to page numbers and links to other units within any of the above units relate to the source specifications and not this qualification.

For further information about these units, please refer to the Register of Regulated Qualifications (www.ofqual.gov.uk) or to the National Database of Accredited Qualifications (www.accreditedqualifications.org.uk).

Edexcel BTEC Level 3 Diploma in Engineering (Specialist: Electrical/ Mechanical) (QCF)

The Edexcel BTEC Level 3 Diploma in Engineering (Specialist: Electrical/Mechanical) (QCF) is a is a 60 credit and 360 guided learning hour (GLH) qualification that consists of optional units that provide for a combined total of 60 credits.

Edexcel BTEC Level 3 Diploma in Engineering (Specialist: Electrical/ Mechanical) (QCF)				
Unit code	**Optional units**	**Credit**	**GLH**	**Level**
D/600/0262	Applications of Mechanical Systems in Engineering	10	60	3
H/600/0263	Principles and Applications of Fluid Mechanics	10	60	3
T/600/0185	Principles and Applications of Thermodynamics	10	60	3
K/600/0264	Electro, Pneumatic and Hydraulic Systems and Devices	10	60	3
F/600/0268	Advanced Mechanical Principles and Applications	10	60	3
M/600/0301	Mechanical and Thermal Treatment of Metals	10	60	3
T/600/0302	Structure and Properties of Metals	10	60	3
K/600/0300	Principles and Applications of Electronic Devices and Circuits	10	60	3
Y/600/0373	Electronic Measurement and Testing	10	60	3
M/600/0346	Monitoring and Analysing Engineering Activities	10	60	3
K/600/6744	Principles and Applications of Analogue Electronics	10	60	3
A/600/6747	Construction and Applications of Digital Systems	10	60	3
D/600/0276	Selecting and Using Programmable Controllers	10	60	3
Y/600/7114	Microprocessor Systems and Applications	10	60	3
T/600/7119	Principles and Applications of Microcontrollers	10	60	3
F/600/6751	Electronic Fault-finding	10	60	3
R/600/0341	Electrical Technology	10	60	3
Y/600/0342	Electrical Installation	10	60	3
H/600/7116	Principles and Operation of Three-phase Systems	10	60	3
K/600/7117	Three-phase Motors and Drives	10	60	3
Y/600/7226	Further Electrical Principles	10	60	3

Note: The units in this qualification are drawn from the qualifications below without any change as noted in the table.

Source specification	QAN
Edexcel BTEC Level 3 Extended Diploma in Electrical/Electronic Engineering (QCF)	500/8097/0
Edexcel BTEC Level 3 Extended Diploma in Mechanical Engineering (QCF)	500/7296/1

Note: References to page numbers and links to other units within any of the above units relate to the source specifications and not this qualification.

For further information about these units, please refer to the Register of Regulated Qualifications (www.ofqual.gov.uk) or to the National Database of Accredited Qualifications (www.accreditedqualifications.org.uk).

Assessment and grading

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

Each of the units within the qualifications have specified assessment criteria and grading criteria which must be used. A summative unit grade can be awarded at pass, merit or distinction.

- To achieve a 'pass' a learner must have successfully completed **all** the assessment criteria
- To achieve a 'merit' a learner must **additionally** have successfully completed **all** the merit grading criteria
- To achieve a 'distinction' a learner must **additionally** have successfully completed **all** the distinction grading 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 and grading 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 and grading 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 and grading 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 and grading criteria must be clearly indicated in the assignment 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 and grading criteria.

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

Qualification grade

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

In the Edexcel BTEC Level 3 Specialist 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 and grading 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

Edexcel BTEC Level 3 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 the Edexcel BTEC Level 3 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 Edexcel.

The Edexcel quality assurance processes will involve:

- centre approval for those centres not already recognised as a centre for BTEC qualifications
- approval for the Edexcel BTEC Level 3 qualifications and units
- **compulsory** Edexcel-provided training and standardisation for internal verifiers and assessors leading to the accreditation of lead internal verifiers via the OSCA system
- quality review of the centre verification practice
- centre risk assessment by Edexcel of overarching processes and quality standards
- remedial training and/or assessment sampling for centres identified through standardisation or risk assessment activities as having inadequate quality, assessment or internal verification processes.

Approval

Centres are required to declare their commitment to ensuring the quality of the programme of learning and providing 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 BTEC approval are able to gain qualification approval online. New centres must complete a centre approval application.

Quality Assurance Guidance

Details of quality assurance for the Edexcel BTEC Level 3 qualifications are set out in centre guidance which is published on our website (www.edexcel.com).

Programme design and delivery

Mode of delivery

Edexcel does not define the mode of delivery for Edexcel BTEC Level 3 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

Edexcel BTEC Level 3 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 Edexcel.

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 Edexcel BTEC Level 3 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.

Additional and Specialist Learning

Additional and Specialist Learning (ASL) consists of accredited qualifications at the same level as, or one level above a 14-19 Diploma course of study, which have been approved under Section 96 of the Learning and Skills Act 2000. The ASL may include BTEC qualifications which are also available to learners not following a 14-19 Diploma course of study.

ASL qualifications are listed on the 14-19 Diploma Catalogue which is available on the Register of Regulated Qualifications (www.ofqual.gov.uk). The catalogue will expand over time as more qualifications are accredited and approved.

Centres undertaking, or preparing to undertake, ASL should refer regularly to the Edexcel website for information regarding additions and the 14-19 Diploma Catalogue for the latest information.

Access and recruitment

Edexcel'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 Edexcel's 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.

Restrictions on learner entry

The Edexcel BTEC Level 3 qualifications in Engineering (Specialist: Electrical/Mechanical) (QCF) are accredited on the QCF for learners aged 16 and above.

Access arrangements and special considerations

Edexcel's policy on access arrangements and special considerations for BTEC and Edexcel NVQ qualifications aims to enhance access to the qualifications for learners with disabilities and other difficulties (as defined by the 1995 Disability Discrimination Act and the amendments to the Act) without compromising the assessment of skills, knowledge, understanding or competence.

Further details are given in the policy document *Access Arrangements and Special Considerations for BTEC and Edexcel NVQ Qualifications*, which can be found on the Edexcel website (www.edexcel.com). This policy replaces the previous Edexcel policy (Assessment of Vocationally Related Qualifications: Regulations and Guidance Relating to Learners with Special Requirements, 2002) concerning learners with particular requirements.

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.

Edexcel 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.

Unit format

All units in the Edexcel BTEC Level 3 Specialist qualifications have a standard format. The unit format is designed to give guidance on the requirements of the qualification for learners, tutors, assessors and those responsible for monitoring national standards.

Each unit has the following sections.

Unit title

The unit title is accredited on the QCF and this form of words will appear on the learner's Notification of Performance (NOP).

Unit code

Each unit is assigned a QCF unit code that appears with the unit title on the National Database of Accredited Qualifications.

QCF level

All units and qualifications within the QCF will have a level assigned to them, which represents the level of achievement. There are nine levels of achievement, from Entry Level to Level 8. The level of the unit has been informed by the QCF level descriptors and, where appropriate, the NOS and/or other sector/professional benchmarks.

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 are defined as all the times when a tutor, trainer or facilitator is present to give specific guidance towards the learning aim being studied on a programme. This definition includes lectures, tutorials and supervised study in, for example, open learning centres and learning workshops. It also includes time spent by staff assessing learners' achievements. It does not include time spent by staff in day-to-day marking of assignments or homework where the learner is not present.

Unit aim and purpose

The aim provides a clear summary of the purpose of the unit and is a succinct statement that summarises the learning outcomes of the unit.

Unit introduction

The unit introduction gives the reader an appreciation of the unit in the vocational setting of the qualification, as well as highlighting the focus of the unit. It gives the reader a snapshot of the unit and the key knowledge, skills and understanding gained while studying the unit. The unit introduction also highlights any links to the appropriate vocational sector by describing how the unit relates to that sector.

Learning outcomes

The learning outcomes of a unit set out what a learner is expected to know, understand or be able to do as the result of a process of learning.

Assessment and grading criteria

The assessment and grading criteria of a unit specify the standard a learner is expected to meet to demonstrate that a learning outcome, or set of learning outcomes, has been achieved. The learning outcomes and assessment and grading criteria clearly articulate the learning achievement for which the credit will be awarded at the level assigned to the unit.

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 and grading 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 and grading criteria.

Content structure and terminology

The information below shows the unit content is structured and gives the terminology used to explain the different components within the content.

- Learning outcome: this is shown in bold at the beginning of each section of content.
- Italicised sub-heading: it contains a key phrase or concept. This is content which must be covered in the delivery of the unit. Colons mark the end of an italicised sub-heading.

- Elements of content: the elements are in plain text and amplify the sub-heading. The elements must be covered in the delivery of the unit. Semi-colons mark the end of an element.
- Brackets contain amplification of content which must be covered in the delivery of the unit.
- 'eg' is a list of examples, used for indicative amplification of an element (that is, the content specified in this amplification could be covered or could be replaced by other, similar material).

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 and grading 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 Edexcel to offer the qualification.
- *Indicative resource materials* – gives a list of learner resource material that benchmarks the level of study.

Units

D/600/0262:	Applications of Mechanical Systems in Engineering
H/600/0263:	Principles and Applications of Fluid Mechanics
T/600/0185:	Principles and Applications of Thermodynamics
K/600/0264:	Electro, Pneumatic and Hydraulic Systems and Devices
F/600/0268:	Advanced Mechanical Principles and Applications
M/600/0301:	Mechanical and Thermal Treatment of Metals
T/600/0302:	Structure and Properties of Metals
K/600/0300:	Principles and Applications of Electronic Devices and Circuits
Y/600/0373:	Electronic Measurement and Testing
M/600/0346:	Monitoring and Analysing Engineering Activities
K/600/6744:	Principles and Applications of Analogue Electronics
A/600/6747:	Construction and Applications of Digital Systems
D/600/0276:	Selecting and Using Programmable Controllers
Y/600/7114:	Microprocessor Systems and Applications
T/600/7119:	Principles and Applications of Microcontrollers
F/600/6751:	Electronic Fault-finding
R/600/0341:	Electrical Technology
Y/600/0342:	Electrical Installation
H/600/7116:	Principles and Operation of Three-phase Systems
K/600/7117:	Three-phase Motors and Drives
Y/600/7226:	Further Electrical Principles

Further information

For further information please call Customer Services on 0844 576 0026 (calls may be recorded for training purposes) or visit our website (www.edexcel.com).

Useful publications

Related information and publications include:

- *Guidance for Centres Offering Edexcel/BTEC QCF Accredited Programmes* (Edexcel, distributed to centres annually)
- Functional skills publications – specifications, tutor support materials and question papers
- *Regulatory arrangements for the Qualification and Credit Framework* (published by Ofqual) August 2008
- the current Edexcel publications catalogue and update catalogue.

Edexcel publications concerning the Quality Assurance System and the internal and external verification of vocationally related programmes can be found on the Edexcel website and in the Edexcel publications catalogue.

NB: Some of our publications are priced. There is also a charge for postage and packing. Please check the cost when you order.

How to obtain National Occupational Standards

Contact:

Semta – the Sector Skills Council for Science, Engineering and Manufacturing Technologies

14 Upton Road

Watford

WD18 0JT

Telephone: 0845 643 9001

Fax: 01923 256086

Website: www.semta.org.uk

Professional development and training

Edexcel supports UK and international customers with training related to BTEC qualifications. This support is available through a choice of training options offered in our published training directory or through customised training at your centre.

The support we offer focuses on a range of issues including:

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

The national programme of training we offer can be viewed on our website (www.edexcel.com/training). You can request customised training through the website or by contacting one of our advisers in the Training from Edexcel team via Customer Services to discuss your training needs.

Our customer service numbers are:

BTEC and NVQ	0844 576 0026
GCSE	0844 576 0027
GCE	0844 576 0025
The Diploma	0844 576 0028
DIDA and other qualifications	0844 576 0031

Calls may be recorded for training purposes.

The training we provide:

- is active – ideas are developed and applied
- is designed to be supportive and thought provoking
- builds on best practice.

Our training is underpinned by the LLUK standards for those preparing to teach and for those seeking evidence for their continuing professional development.

Annexe A

The Edexcel/BTEC qualification framework for the Engineering sector

Progression opportunities within the framework.

Level	General qualifications	Diplomas	BTEC vocationally-related qualifications	BTEC specialist qualification/ professional	NVQ/competence
8					
7					
6					

Level	General qualifications	Diplomas	BTEC vocationally-related qualifications	BTEC specialist qualification/ professional	NVQ/competence
5			Edexcel BTEC Level 5 HND Diploma in Manufacturing Engineering Edexcel BTEC Level 5 HND Diploma in Mechanical Engineering Edexcel BTEC Level 5 HND Diploma in Operations Engineering Edexcel BTEC Level 5 HND Diploma in Electrical/Electronic Engineering Edexcel BTEC Level 5 HND Diploma in General Engineering Edexcel BTEC Level 5 HND Diploma in Automotive Engineering Edexcel BTEC Level 5 HND Diploma in Aeronautical Engineering		

Level	General qualifications	Diplomas	BTEC vocationally-related qualifications	BTEC specialist qualification/ professional	NVQ/competence
4			Edexcel BTEC Level 4 HNC Diploma in Manufacturing Engineering Edexcel BTEC Level 4 HNC Diploma in Mechanical Engineering Edexcel BTEC Level 4 HNC Diploma in Operations Engineering Edexcel BTEC Level 4 HNC Diploma in Electrical/Electronic Engineering Edexcel BTEC Level 4 HNC Diploma in General Engineering Edexcel BTEC Level 4 HNC Diploma in Automotive Engineering Edexcel BTEC Level 4 HNC Diploma in Aeronautical Engineering		Please refer to www.edexcel.com

Level	General qualifications	Diplomas	BTEC vocationally-related qualifications	BTEC specialist qualification/ professional	NVQ/competence
3		Edexcel Level 3 Diploma in Engineering	Edexcel Level 3 BTEC Certificate, Subsidiary Diploma, Diploma and Extended Diploma in Engineering Edexcel Level 3 BTEC Diploma and Extended Diploma in Mechanical Engineering Edexcel Level 3 BTEC Diploma and Extended Diploma in Manufacturing Engineering Edexcel Level 3 BTEC Diploma and Extended Diploma in Operations and Maintenance Engineering Edexcel Level 3 BTEC Diploma and Extended Diploma in Electrical/Electronic Engineering Edexcel Level 3 BTEC Diploma and Extended Diploma in Aeronautical Engineering	Edexcel Level 3 BTEC Award/Certificate/Diploma in Engineering (Specialist: Aeronautics) (QCF) Edexcel Level 3 BTEC Award/Certificate/Diploma in Engineering (Specialist: Applied Science) (QCF) Edexcel Level 3 BTEC Award/Certificate/Diploma in Engineering (Specialist: Electrical/Mechanical) (QCF) Edexcel Level 3 BTEC Award/Certificate/Diploma in Engineering (Specialist: Manufacturing Engineering) (QCF) Edexcel Level 3 BTEC Award/Certificate/Diploma in Engineering (Specialist: Operations and Maintenance) (QCF)	Please refer to www.edexcel.com

Level	General qualifications		Diplomas	BTEC vocationally-related qualifications	BTEC specialist qualification/ professional	NVQ/competence
2	GCSE Engineering GCSE Manufacturing		Edexcel Level 2 Diploma in Engineering	Edexcel Level 2 BTEC Certificate, Extended Certificate and Diploma in Engineering	Edexcel BTEC Level 2 Award/Certificate/Extended Certificate in Engineering (Specialist: Applied Science) (QCF) Edexcel BTEC Level 2 Award/Certificate/Extended Certificate in Engineering (Specialist: Manufacturing Engineering) (QCF)	Please refer to www.edexcel.com
1			Edexcel Level 1 Diploma in Engineering	Edexcel BTEC Level 1 Award, Certificate and Diploma in Engineering		Please refer to www.edexcel.com
Entry						

Annexe B

Glossary of Accreditation Terminology

The following information about these qualifications can also be found on the National Database of Accredited Qualifications(NDAQ): www.accreditedqualifications.org.uk

Accreditation start/end date	The first/last dates that Edexcel can register learners for a qualification.
Certification end date	The last date on which a certificate may be issued by Edexcel.
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 (GLH)	Guided learning hours are defined as all the times when a tutor, trainer or facilitator is present to give specific guidance towards the learning aim being studied on a programme. This definition includes lectures, tutorials and supervised study in, for example, open learning centres and learning workshops. It also includes time spent by staff assessing learners' achievements. It does not include time spent by staff in day-to-day marking of assignments or homework where the learner is not present.
Learning Aims Database	Link to the Learning Aims Database, which features detailed funding information by specific learning aim reference.
Learning Aim Reference	Unique reference number given to the qualification by the funding authorities on accreditation.
Level	The level at which the qualification is positioned in the Qualifications and Credit Framework (QCF).
Performance tables	These qualifications are listed on the Department for Education (DfE) website School and College Achievement and Attainment Tables (SCAAT) as performance indicators for schools and colleges.
Qualifications Accreditation Number (QAN)	Unique reference number given to the qualification by the regulatory authorities on accreditation.
Register of Regulated Qualifications	Link to the entry on the Register of Regulated Qualifications for a particular qualification. This database features detailed accreditation information for the particular qualification.

Section 96	Section 96 is a section of the Learning and Skills Act 2000. This shows for which age ranges the qualification is publicly funded for under-19 learners.
Section 97	Section 97 is a section of the Learning and Skills Act 2000. This shows whether the qualification is publicly funded for learners aged 19 and over.
Title	The accredited title of the qualification.

Annexe C

BTEC Specialist and Professional qualifications

BTEC qualifications on the NQF	Level	BTEC Specialist and Professional Qualifications on the QCF	BTEC qualification suites on the QCF
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 Professional and Specialist Qualifications on the QCF	BTEC qualification suites on the QCF
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

QCF = Qualifications and Credit Framework

For most qualifications on the **NQF**, the accreditation end date is normally 31 August 2010 or 31 December 2010.

For qualifications on the **QCF**, the accreditation start date is usually 1 September 2010 or 1 January 2011.

QCF qualification sizes	
Award	1-12 credits
Certificate	13-36 credits
Diploma	37+ credits

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

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For more information on Edexcel and BTEC qualifications please visit our website: www.edexcel.com